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LIST

OF THE

MEMBERS, ASSOCIATES, AND APPRENTICES

OF

The Pharmaceutical Society of Great Britain,

INCLUDING THE NAMES OF THE LOCAL SECRETARIES.

1863.

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FOREIGN AND COLONIAL LIFE MEMBERS.

Year of Membership.	No. of Certificate.	NAME.	RESIDENCE.
1851		Alexander, James Lyon	Sydney
1858	486	Avice, Charles Ernest	Mauritius
1848	34	Baeër, Gustave E.	Strasbourg
1855	401	Baissac, Pierre Joseph	Mauritius
1859		Baker, George S	Geneva
1852	167	Baschet, George Constant	Mauritius
1858	505	Baschet, Pierre Edmond	Mauritius
1849		Baylis, William	Launceston, Tasmania
1852		Bishop, William	Wellington, N. Zealand
1858	506	Boullé, Janvier Alfred	Mauritius
1862		Bowen, William	Melbourne
1852		Carpenter, Henry	Demerara
1854	347	Dru, Casimir Theodore A.	Mauritius
1849	74	Fleurot, Emile	Mauritius
1855	389	Francis, Henry	Melbourne
1859	3	French, Joseph B.	Castlemaine, Australia
1863	701	Gras, Marcel Amédée	Mauritius
1853		Guiot, Jean Félix E.	Mauritius
1863	702	Guiot, Louis Edouard	Mauritius
1850	82	Lamusse, Louis A.	Mauritius
1847		Lediard, Charles	St. Vincent
1851	93	Mailloux, Auguste	Mauritius
1847	28	Mailloux, Joseph	Mauritius
1859	558	Mathew, John Alfred	Cape Town
1858	508	Minet, Alphonse Edouard	Mauritius
1863	704	Merle, Etienne Nemours	Mauritius
1847	19	Nobrega, Gerardo José da	Madeira
1855	407	Noël, Ferdinand	Mauritius
1860	526	Parker, Charles	Melbourne
1859	549	Perrot, Pierre Bénoni	Mauritius
1852	118	Regnaud, Charles	Mauritius
1860	588	Renaud, Desiré Monchéry	Mauritius
1850		Roberts, Henry	Florence
1852		Roberts, Thomas H.	Gibraltar
1843		Rogers, Henry	Bombay
1852	72	Simimberghi, Nicholas	Rome
1858	467	Skinner, Henry	Kingston, Canada West
1844	1	Sparks, John	Bombay
1857	468	De Valancé, Charles P.	Mauritius
1859		White, Robert	California

The figures in the second column correspond with the number of the Certificate of Examination.

LONDON MEMBERS.

Year of Membership.	No. of Certificate.	NAME.	ADDRESS.
1850	70	Allchin, Alfred	Richmond Road, Barnsbury Park
1841		Allen, William	2, Morgan's Place, Islington
1844		*Ambrose, Thomas	94, Whitechapel Road
1842		Anderson, Charles	23, Lower Belgrave Street
1857	241	Andrews, Frederick	23, Leinster Terrace, Upper Hyde [Pk. Gardens
1862	661	*Applegate, Edwin	Upper Holloway
1842		Appleton, Thomas Cass	45, Curzon Street
1841		Ashton, William	154, Sloane Street
1853		Attwood, Alfred	61, Cannon Street
1841		Austin, Henry	161, Bermondsey Street
1853		Bailey, Delamore J.	30, Conduit Street
1841		Baiss, James	102, Leadenhall Street
1841		Baiss, William A.	102, Leadenhall Street
1859	556	*Baker, Alfred Philip	9, Oakley Terrace, Old Kent Ro
1841		Baker, William J.	21, Brecknock Place, Camden Town
1861	537	*Baldock, John Henry	55, St. James's Road, Holloway
1845		Ball, Thomas M.	77, St. George's Road, Southwark
1841		Balmer, John	94, St. John Street Road
1842		Barber, Joseph	7, Orange Street, Red Lion Square
1841		Barber, Thomas A.	2, Scott's Place, Islington
1856	14	Barkley, William	18, Little Tower Street
1848		Barnard, John	31, Upper Gower Street
1853		Barnes, James B.	1, Trevor Terrace, Knightsbridge
1853		Barron, Frederick	2, Bush Lane
1858	504	Barrs, John Adcock	55, Fore Street, City
1841		Barry, John T.	Plough Court, Lombard Street
1841		Bartlett, William	1, Brettin Terrace, Chelsea
1844		Bastick, William	2, Brook Street
1841		Bayley, Edmund	17, St. Mary's Terr., Walworth Rd.
1851		Beaton, John	174, Shoreditch
1863		Beaton, William John	132, Edgware Road
1853		Becket, William E.	6, Giltspur Street
1853	17	*Bell, William Henderson	48, Albany Street, Regent's Park
1842		Bentley, William	16, Tyssen Street
1841		Bigg, Thomas	Great Dover Street
1842		Binge, Thomas	23, Stockbridge Terrace, Pimlico
1850	57	Bird, Augustus	22, High Street, Kensington
1841		Bird, William L.	42, Castle Street East
1859	322	Bishop, Alfred	Mile End New Town
1843		Blake, Charles T.	47, Piccadilly
1842		Bland, John	57, Penton Street, Pentonville
1841		Blandford, John F.	9, Bruton Street
1863	518	Bolton, Horatio Nelson	High Street, Stoke Newington
1853		Bolton, William	146, Holborn Bars
1842		Bond, Henry	11, Cross Street, Hoxton New Town
1853		Boothby, Henry Neal	72, Crawford Street
1842		Boully, Peter	Queen's Road, Bayswater
1849		Bourdas, Isaiah	10, Pont Street, Belgrave Square
1862	604	*Bourdas, Isaiah, jun.	21, Upper Eccleston-pl., Belgrave rd.
1842		Bowden, Edward	13, Charles Street, St. James's
1852		Bower, William	96, Tottenham Court Road
1842		Bradley, John	21, Belgrave Road, Westminster

* Life Members.

Year of Membership.	No. of Certificate.	NAME.	ADDRESS.
1847		Brewer, Eli	43, Duke Street, Manchester Sq.
1853	190	Bromley, Richard Martin	Denmark Hill
1845		Brooks, Charles	Southville, Wandsworth Road
1842		Brown, James	27, Aldgate
1842		Buck, Thomas	Kingsland Green
1842		Buckle, Christopher Fran.	77, Gray's Inn Road
1846		*Bucklee, William H.	86, New Bond Street
1845		*Burden, Edward	38, Duke Street, Grosvenor Square
1846		Burden, Thomas	6, Store Street, Bedford Square
1853		Burgoyne, James	16, Coleman Street
1857	333	*Butt, Edward Northway	235, Oxford Street
1855		Carr, John	171, High Holborn
1853		Carrick, James	46, Churton Street, Belgrave Road
1853		Carty, John	172, New Bond Street
1853		Cattell, George	Camberwell New Road
1853		*Chard, Frederick J.	13, Eccleston Street South
1847		Charsley, Nathaniel	4, Manor Rise, Brixton
1859	487	*Chrispin, William	17, Church Path, Hackney
1853		Chubb, James C.	59, St. John Street, Clerkenwell
1845		Clarke, Benjamin	Mare Street, Hackney
1853		*Cockrill, James	2, Wellington St., Waterloo Town
1849		Cocksedge, Henry B.	20, Bucklersbury
1852		Colchester, William M.	2, Crown Street, Hoxton
1854	191	Coles, Charles	72, Euston Square
1842		Coles, John	New Road, Camberwell
1845		Collins, John R.	Haverstock Hill
1853		Collins, Robert N.	Oxford Court, Cannon Street
1841		Compton, Charles	14, Brewer Street, Golden Square
1848		Constance, Edward	37, Leadenhall Street
1841		Constance, William	5, Hanover Place, Regent's Park
1853		Cooke, John	171, Hoxton Old Town
1853		Cooper, Robert H.	20, Royal Exchange
1848		Cooper, William T.	26, Oxford Street
1862		Cooper, William Henry	Andover Terrace, Hornsey Road
1847		Corfield, Daniel	22, Thrawl Street, Spitalfields
1853		Cornelius, Joseph	Clapham
1848		Cowdery, George T.	36, Paternoster Row
1861		Cowl, William	11, Bridge Terrace, Paddington
1845		Cracknell, Charles	107, Edgware Road
1859		Crispe, James	4, Cheapside
1853		Cross, Henry	309, New North Road
1841		Croucher, John T.	223, High Street, Shadwell
1853		Croyden, Charles	37, Wigmore Street
1852		Curtis, Frederick	48, Baker Street
1853		*Darby, Stephen	140, Leadenhall Street
1842		Davenport, John T.	33, Great Russell St., Bloomsbury
1841		Davies, Charles	4, Claremont Place, North Brixton
1845		Davies, Henry E.	43, Wood Street, City
1860	377	Davies, William G.	28, Sidney Place, Commercial Road
1841		*Davy, Charles	100, Upper Thames Street
1841		Deane, Henry	Clapham
1850		Dickinson, William	16, Cambridge St., Edgware Road
1842		Doughty, Ed. Davidson	4, William Street, Knightsbridge
1841		Down, John	1, Queen's Road, Bayswater

Year of Membership.	No. of Certificate.	NAME.	ADDRESS.
1859	352	Dyson, William B.	4, Gloucester Rd., South Kensington
1845		Eade, George	39, Goswell Road
1847		Eardley, John	14, Charles St., Westbourne Terrace
1841		Eddy, Charles W	30, Crown Street, Finsbury
1853		Edwards, William S.	14, Eltham Place, Old Kent Road
1853		Elam, Benjamin	196, Oxford Street
1853		Elkington, Edward	56, Grange Road, Bermondsey
1849		Ellis, George H.	4, Pavement, Finsbury
1853		Elvey, Thomas	8, Halkin Street West
1841		Evans, John	60, Bartholomew Close
1851		Evans, John H.	60, Bartholomew Close
1841		Faulconer, Robert H.	Keen's Row, Walworth
1853		Fells, John	Strand
1853		Fenn, John T.	83, Regent Street, Westminster
1856	88	*Field, James John	5A, Holloway Place, Holloway
1841		Field, William	27, Queen's Buildings, Brompton
1842		Fincham, Robert	57, Baker Street
1863	652	*Fisher, Francis Dixon	5, Liverpool Street
1858	160	Forrest, Richard	9, Celbridge Pl., Westbourne Park
1842		Foulger, Samuel	133, St. George's Street East
1841		Fowler, Richard	14, Brewer Street, Golden Square
1863	623	*Fowler, Stanley	36, Elgin Terrace, Notting Hill
1841		Fox, William	48, Church Street, Bethnal Green
1856		Francis, George B.	11, Old Fish Street, City
1857		Francis, George	8, Hereford Rd., Westbourne Grove
1841		Freeman, John	59, Stamford Street
1853		Freeman, Richard	5, Clayton Place, Kennington Road
1843		*Freeman, Robert	38, High Street, Kensington
1853		Gadd, Charles	1, New Bridge Street, Vauxhall
1842		Gale, Henry	3, Millbrook Place, Camden Town
1854	78	Gale, Samuel	338, Oxford Street
1841		Galliers, George	230, Tottenham Court Road
1841		Garden, Alexander	372, Oxford Street
1843		Garden, Felix R.	372, Oxford Street
1858		Gedge, William Stedman	77, St. John Street
1850		*Gerard, Philip Augustus	390, Strand
1848		Gigner, John	King's Road Chelsea
1861	570	*Gilbert, George Fagge	20, Morton Street West, Pimlico
1843		Gill, George W	15, Crown Place, Walworth
1842		Glover, George	19, Goodge Street
1841		*Gloyne, Charles	20, Victoria Road, Kensington
1842		Goddard, John D	6, Arthur Street, City
1853		Golding, William	42, Upper Albany Street
1842		Goodbarne, Thomas	13, Charles Place, Charles Square
1842		Goodbarne, Thomas R.	Hornsey Road
1853		Goode, Thomas	47, Minories
1847		Goodger, David	31, Regent Street
1853		Goosey, William	6, Ocean Row, Stepney
1853		Gorton, John G.	144, High Street, Whitechapel
1854		*Gosden, Henry	140, Leadenhall Street
1856		Gould, John	Chicksand Street
1853		Gould, John Granger	198, Oxford Street
1847		Greenish, Thomas	20, New Street, Dorset Square
1842		Griffiths, John	Clerkenwell Green

Year of Membership.	No. of Certificate.	NAME.	ADDRESS.
1853		Grisdale, John M.	216, Tottenham Court Road
1853		Gristock, Thomas	42, South St., Manchester Square
1863	703	Grundy, Thomas	18, Hampton Terr., Haverstock Hill
1863	689	Guesdon, Victor	47, Gerrard Street, Soho
1851		Gulliver, William	33, Lower Belgrave Street
1857		Hall, Robert	48, Wigmore Street
1841		Hanbury, Cornelius	Plough Court, Lombard Street
1841		*Hanbury, Daniel Bell	Plough Court, Lombard Street
1857		*Hanbury, Daniel	Plough Court, Lombard Street
1853		Harris, Daniel R.	55, St. James's Street
1863	38	Harrison, Robert Hooper	Pownall Road, Dalston
1852		Harvey, Edward	6, Giltspur Street
1855		Haselden, Adolphus F.	18, Conduit Street
1843		Hemingway, Alexander	20, Portman Street
1842		Henly, John C.	213, Upper Thames Street
1853		Henty, Henry M	87, High Street, St. John's Wood
1841		Herring, Edward	Lombard Road, Battersea
1841		Herring, Thomas	40, Aldersgate Street
1841		Herring, William	40, Aldersgate Street
1843		Hewitt, John	1, Wellclose Street, Wellclose Sq.
1842		Hewlett, Charles J.	Cree Church Lane
1852		Hickley, Thomas P.	125, Edgware Road
1842		Hill, Arthur S.	11, Little Britain
1853		Hill, Arthur B.	11, Little Britain
1853		Hillgenberg, Henry	38, Houndsditch
1848		Hills, Thomas H.	338, Oxford Street
1852		Hockin, John B.	38, Duke Street, Manchester Square
1848		Hodgkinson, Henry	3, Newland Terrace, Kensington
1852		Hogg, Robert	9, Albion Place, Hyde Park Square
1841		Hooper, Bartlett	43, King William Street, City
1841		Hooper, Hugh H	22, Commerce Place, Brixton
1841		Hooper, William	24, Gt. Russell St., Covent Garden
1842		Hooper, William	7, Pall Mall East
1853		Hopkin, William K.	5, New Cavendish Street
1849		Hopkins, Thomas	34, Montague Square
1851		Hopkins, Thomas B.	Tulse Hill, Brixton
1853		Hora, Henry W.	58, Minories
1853	175	Horncastle, John	12, Stanhope Terrace
1841		Horner, Edward	20, Bucklersbury
1841		Horner, James T.	20, Bucklersbury
1859		Howden, Robert	78, Gracechurch Street
1856	412	Howell, Maurice	Peckham
1856	435	*Howell, Thomas	81, High Street, Camden Town
1842		Hucklebridge, James M.	103, Upper Ebury Street
1841		Hudson, William B.	27, Haymarket
1843		Hughes, William P.	171, Hoxton Old Town
1853		Hugill, John	61, Cannon Street
1842		Humpage, Benjamin	1, St. George's Ter., Liverpool Rd.
1862	494	Humphreys, Richard	9, Upper Belsize Ter., Belsize Park
1853	198	*Hunt, William	Camberwell Green
1853		Huskisson, Henry O.	12, Constitution Row, Gray's Inn Rd.
1842		Huskisson, John	12, Swinton Street
1841		*Huskisson, William	12, Swinton Street
1848		Huxtable, John	104, St. John Street Road

Year of Membership.	No. of Certificate.	NAME.	ADDRESS.
1848		Huxtable, William	104, St. John Street Road
1863	685	Ince, Joseph	26, St. George's Pl., Knightsbridge
1853		Ingram, Robert	2, Queen's Terrace, St. John's Wood
1841		Jackson, John	47, Southampton Row
1845		Jeynes, George W.	42, Princess Street, Edgware Road
1853		Jobson, Thomas C. W.	87, Lever Street, Goswell Street
1861	592	Johnson, Benjamin M.	70, Tottenham Court Road
1853		Jolley, George	13, Curzon Street, Mayfair
1849		Jones, Henry S.	Fulham Road
1842		Jones, Peter	11, Norton Folgate
1849		Jones, William John	19, Park Road, St. John's Wood
1841		Keating, Thomas	79, St. Paul's Churchyard
1842		Kemp, Richard	208, Upper Street, Islington
1842		Kemp, Robert	2, Queen's Place, Holloway
1859	325	Kendall, Charles Fisher	14, Old Dorset Place, Clapham Road
1841		Kent, Thomas	226, Blackfriars Road
1848		*Kernot, George	2, Chrisp Street, Poplar
1852	81	Kershaw, George Charles	113, Park Street, Camden Town
1853		Kettle, Joseph	42, Castle Street East
1862	307	Kiddle, William Lambert	34, Tavistock Place
1853		King, Charles T.	86, Snow Hill
1855	309	Kingdon, William Y.	6, Devonshire Terrace, Notting Hill
1853		Lacy, Benjamin W.	13, Westbourne Grove
1842		*Langton, Frederick C. R.	226, Upper Thames Street
1850		Large, John H.	2, Holt Place, New North Road
1853		Lavers, Henry Richard	28, Old Street Road
1857	429	Lawrence, Henry	49, High Street, Kensington
1855		Lawrence, Frederick	8, New Chapel Street, Kentish Town
1841		Lescher, Joseph S.	60, Bartholomew Close
1842		Lessey, John	97, High Street, Marylebone
1853		Lidwell, Joshua E.	130, High Street, Notting Hill
1861	388	*Lomas, Joseph W.	5, Henry's Place, Old Kent Road
1853	260	Long, George	11, Hugh Street West, Pimlico
1860	586	Long, Henry	48, High Street, Notting Hill
1853		Lowe, William E.	8, Stafford Street, Bond Street
1841		*Luckombe, Charles	86, Snow Hill
1841		*Macmurdo, Edward	100, Upper Thames Street
1849		McCulloch, Charles	Covent Garden
1842		McCulloch, William	5, Coleman Street
1853		McDougall, William	8, Union Terrace, Notting Hill
1849		Maitland, Alexander	8, Torrington Place, Torrington Sq.
1841		Maitland, John	10, Chester Place, Hyde Park
1853		Mansell, William	Plough Court, Lombard Street
1853		Marris, Joseph	37, Berners Street
1853		Marshall, Thomas	2, Claylands Place, Clapham Road
1853		Matland, George	10, Nassau Place, Commercial Road
1842		May, John	Battersea
1857		*Medlock, Henry	20, Great Marlborough Street
1842		Meggeson, George	Wandsworth
1853		Merrell, James	1, Queen's Terrace, Camden Villas
1857	485	*Michell, Frederic	3, Rye Lane, Peckham
1863		Middleton, Francis	338, Oxford Street
1855		Mitchell, John	254, Upper Street, Islington
1842		Moody, James	24, Church Street, Camberwell

Year of Membership.	No. of Certificate.	NAME.	ADDRESS.
1846		Moore, James L.	1, Craven Street, Westbourne Ter.
1841		*Mordaunt, John	Liverpool Road
1853		Morson, Thomas	19, Southampton Row
1841		*Morson, Thomas N. R. ...	38, Queen Square, Bloomsbury
1841		*Moscrop, Edward H.	140, Strand
1855		Mould, Samuel...............	21, Moorgate Street
1855	218	Mumford, George	5, Bathurst Street, Hyde Park
1860	519	Nicholson, Frederick	216, St. Paul's Road, Highbury
1853		Northway, John	27, Great Tower Street
1855		Oldfield, Henry	94, Smithfield Bars
1841		Orridge, Benjamin B.	30, Bucklersbury
1841		*Orridge, William	22, Ludgate Hill
1853		Palmer, Robert...............	35, Ovington Square
1853		*Parnell, George William...	11, Victoria Road, Pimlico
1842		Pasmore, James	5, Colville Terrace, Chelsea
1853		Pattison, George	126, St. John Street Road
1853		Peacock, Hamerton R. ...	170, High Street, Poplar
1841		Pedler, George S.............	199, Fleet Street
1842		*Penrose, Arthur Wellesley	7, Amwell Street, Clerkenwell
1853		Pepper, John	1, Bedford Street, Bedford Square
1843		Peppin, Sydenham H.......	25, Princes Street, Leicester Sq.
1854		Phillips, John	3, Vernon Pl., Bagnigge Wells Rd.
1842		Philpot, Henry...............	32, Praed Street, Paddington
1858	341	*Pidduck, John	Harrow Road
1843		Plummer, George............	High Street, Peckham
1841		Pollock, Thomas	129, Fenchurch Street
1842		Potts, Robert U.	26, South Audley Street
1853		Power, John Henry.........	Denmark Hill
1846		Pratt, Edmund...............	27, Bishopsgate Within
1842		Preston, Joseph T.	94, Smithfield Bars
1855	68	Quiller, Charles R.	15, Sloane Square
1859	397	Radermacher, Charles J....	173, Sloane Street
1841		Rea, Edward..................	115, Wardour Street
1853		Readman, Henry	18, Mortimer Street, Cavendish Sq.
1841		Redwood, Theophilus	19, Montague Street, Russell Sq.
1861	108	*Reeve, Edward J.............	Kilburn
1856		Reynolds, James John......	3, Hanover Street
1854		Richards, James	40, New Bridge Street, Blackfriars
1845		Richardson, George.........	12, Norland Place, Notting Hill
1848		Ridsdale, James	334, Caledonian Road
1843		Roach, Pope	8, St. James's Street
1860	393	*Robbins, John	372, Oxford Street
1841		Rouse, Benjamin R. C.......	9, Wellington Street, Southwark
1842		Rouse, Frederick J..........	Clapham
1841		Rouse, Robert	1, Wigmore Street
1857	328	Rowntree, Thomas	1, Arundel Place, Islington
1859	415	Rowson, Henry...............	18, Chichester Street
1848		Sadler, William C.	13, Norton Folgate
1841		Sainsbury, Samuel	177, Strand
1843		Sandford, George W.	47, Piccadilly
1863	610	*Sanger, William Albert ...	150, Oxford Street
1853		Schacht, William............	38, Houndsditch
1843		*Sharpe, George Young ...	34, High Street, Notting Hill
1842		Sharwood, James Allen ...	98, Fenchurch Street

Year of Membership.	No. of Certificate.	NAME.	ADDRESS.
1841		*Shirley, John George	1, Westbourne Grove, Bayswater
1852		Simmons, Joseph	38, Lambeth Walk
1851	89	Sims, John F.	8, Hemingford Place, Barnsbury
1854		Skidmore, John...............	3, Charles St. West, Westbourne Ter.
1842		Slipper, James	86, Leather Lane
1847		Smith, William F.	12, Keen's Row, Walworth
1854		Snell, Glanville A............	3, Hampton Ter., Hampstead Rd.
1842		Snelling, Francis	23, Farringdon Street
1843		Solly, Stephen F............	St. George's Circus, Southwark
1841		*Squire, Peter..................	277, Oxford Street
1841		Squire, William	5, Coleman Street
1863	46	Starkie, Richard Stringer .	4, Strand
1858	147	Stathers, John	43, Norland Road, Notting Hill
1849		Stead, John M................	213, Upper Thames Street
1842		Steer, Philip R...............	Church Street, Hackney
1854	97	Stocken, James...............	13, Euston Square
1850		Stuart, John E...............	172, New Bond Street
1853		Summers, James R..........	43, Curtain Road
1854		Swire, George	Brixton Hill
1841		Swire, Roger..................	14, Edgware Road
1853		Symons, William	17, St. Mark's Cres., Regent's Pk.
1854		Taylor, John	77, Hackney Road
1853		Thomas, Henry...............	7, Upper St. Martin's Lane
1855		Thomas, Jabez John	Stoke Newington
1851		Thomas, Richard W.	10, Pall Mall
1845		Thompson, Henry A.	86, Chiswell Street
1857	372	Tibbs, Frederick	47, Blackfriars Road
1860		Tilburn, Robert James ...	331, Goswell Road
1841		Tippett, Benjamin M.......	3, Sloane Street
1841		Tonge, George	213, Upper Thames Street
1842		Towerzey, Alfred............	20, Marylebone Street
1857	61	Trask, Thomas	14, Albany Street
1853		Tupholme, John T.	38, Lamb's Conduit Street
1859	222	Turner, Charles E.	63, Gt. Russell Street, Bloomsbury
1853		Turner, Richard	2, Oxenden Street, Haymarket
1853		Tustin, Thomas H.	London Hospital
1842		Twinberrow, William	2, Edward Street, Portman Square
1852	90	Urwick, William W.........	60, St. George's Road, Pimlico
1853		Vint, James	3, High Street, Bow
1857	357	*Vizer, Edwin B.	63, Lupus Street, Pimlico
1841		*Wagstaff, John Henry......	James Street, Westbourne Terrace
1842		Walker, Alexander	10, Ireland Row, Mile End
1842		*Walker, Henry...............	35, Skinner Street, Somers Town
1845		Ward, Francis	14, Grosvenor Street
1846		*Warner, Charles Heath ...	55, Fore Street
1853		Watts, John Peter	6, Sol's Row, Hampstead Road
1844		Watts, William.	3, Gray's Place, Brompton
1853		Watts, William M.	32, Whitecross Street
1841		Waugh, George	177, Regent Street
1863		Weaver, Thomas Tomkins	18, Norton Folgate
1853		Wegg, William...............	10, North Place, Ball's Pond Road
1842		Westwood, Robert	16, Newgate Street
1842		Westwood, William H......	16, Newgate Street
1854	321	Wheeler, Christopher	56, Hackney Road

Year of Membership.	No. of Certificate.	NAME.	ADDRESS.
1853		*Whitburn, Augustus R. ...	174, Regent Street
1852		White, Daniel	19, Park Terrace, Regent's Park
1841		White, Edmund	19, Park Terrace, Regent's Park
1841		White, John	228, Piccadilly
1842		Wilkes, George..............	1, Hayfield Place, Mile End
1853		Wilkinson, William.........	114, Lambeth Walk
1851		Williams, John...............	5, New Cavendish Street
1854	329	Williams, Terrick J.	13, Tichborne Street
1844		Willmott, William	83, High Street, Southwark
1857		Willows, John	101, High Holborn
1844		Wilson, Joseph...............	20, Sussex Street, Warwick Square
1853		Wilson, Thomas	Upper Holloway
1853		Windle, William	48, Portman Place
1842		Wooldridge, John	290, Euston Road
1855	364	*Wrangham, John............	3, Acre Lane, Brixton
1859		Wright, George Henry ...	7, Poultry
1853		Wright, William V..........	11, Old Fish Street
1842		Wyman, John	122, Fore Street
1858	294	*Yarde, Giles	28, Lamb's Conduit Street
1842		Yates, Benjamin	25, Budge Row, Cannon Street
1859	443	*Yates, Francis	100, Upper Thames Street
1852		Young, Frederick............	137, Minories
1853		Young, George	12, Ebenezer Terrace, Mill Wall
1859		Young, William Herbert...	35, Baker Street

COUNTRY MEMBERS.

Year of Membership.	No. of Certificate.	NAME.	RESIDENCE.
1846		Abbott, John Thomas	Darlington
1853		Abraham, John	Liverpool
1852		Ackerman, Theophilus	Bristol
1845		Ackrill, George	Abergavenny
1847		Acton, George	Worcester
1853		Adams, John	Loughborough
1853		Adams, Jonathan Henry	Stoke-on-Trent
1853		Adkins, Henry James	Birmingham
1849		Ainslie, William	Edinburgh
1852		Aitken, William	Edinburgh
1849		Albright, Henry	Liverpool
1853		Aldridge, Alexander John	Brighton
1852		Alexander, James	Greenock
1862	658	*Allan, Bruce	Edinburgh
1861	620	*Allan, William	Dumfries
1848		Allanson, Charles	Harrogate
1853		Allen, Adam U.	Lymington
1843		Allen, George	Ampthill
1859	555	*Allen, James Hore	Tottenham
1847		Allen, Thompson	Boston
1853		Alpass, Horace S.	Liverpool
1842		Amoore, Charles	Hastings
1858	400	Amos, Daniel	Canterbury
1853		Anderson, Charles Thomas	Jersey
1852	119	Anderson, James	Musselburgh
1862	477	*Andrew, Leyshon	Swansea
1853		Andrew, William	Aberdeen
1841		Andrews, John Betts	Clare
1853		Andrews, Thomas William Cox	Norwich
1854	375	*Anness, Samuel Richard	Ipswich
1841		Anthony, Jacob	Bedford
1862	533	*Anthony, John Lilley	Bedford
1853		Appleby, William H.	Stockport
1853		Archer, Thomas	Southam
1841		Argles, Henry	Maidstone
1858	268	Argles, John	Maidstone
1841		Armstrong, Henry	Preston
1853		Arnold, Adolphus	Guernsey
1841		Arnold, Edward	Norwich
1842		Arthy, Joseph	Peterborough
1853		Ash, James Freer	Wiveliscombe
1853		Ashton, John Swan	Leicester
1853		Ashton, William	Southport
1853		Aslin, John	Sunderland
1846		Asling, Brelsford	Spalding
1855		Astley, John	Coventry
1859	457	*Atherton, John Henry	Nottingham
1861	419	Atkins, Ernest	Deptford
1846		Atkins, Francis Thomas	Woolwich
1842		Atkins, Francis Thomas	Deptford

Year of Membership.	No. of Certificate.	NAME.	RESIDENCE.
1853		Atkins, Samuel Ralph	Salisbury
1855	420	*Atkinson, Matthew	Southport
1853		Atkinson, Richard Marshall	Leeds
1842		*Atkinson, Stephen	Doncaster
1842		Attwood, George	Brompton, Kent
1850		Aubin, James	Jersey
1853		Backhouse, William	Leeds
1844		Badcock, John	Barnard Castle
1841		Baildon, Henry C.	Edinburgh
1852		Baildon, William	Edinburgh
1853		Bailey, Richard	Penrith
1858	431	Bailey, Richard	Portsmouth
1841		Bailey, William	Wolverhampton
1845		Baines, Richard	Blackburn
1850		Baker, Charles Patrick	Chelmsford
1861		Baker, Garrad	Chelmsford
1841		Baker, William	Chelmsford
1852		Baker, William	Twickenham Green
1842		Baker, William	Retford
1855	391	*Balkwill, Frederick Pryor	Plymouth
1844		Ball, George Vincent	Banbury
1841		Ball, Joseph	Oxton, nr. Birkenhd.
1842		Ballard, Edwin	Farringdon
1842		Ballard, William	Abingdon
1850		Balls, George	Deptford
1845		Bally, Edward F.	Baldock
1841		Baly, Henry	Warwick
1859	295	Baly, James	Warwick
1848	12	Bancroft, John James	Ruthin
1859	509	Banfield, Harold	Bury St. Edmunds
1841		Banks, Morris	Birmingham
1859	484	*Banner, Samuel	Liverpool
1853		Barber, George	Liverpool
1845		Barclay, John	Falmouth
1853		Barker, Joseph...	Sudbury
1846		Barling, Thomas	Weymouth
1841		Barnes, James	Preston
1850		Barnett, William	Brighton
1853		Barnish, Edwin H.	Wigan
1853		Barritt, George	Croydon
1849		Barron, William	Cheltenham
1853		Barry, Edwin	Northampton
1853		Barry, James	Northampton
1861	256	Barry, Thomas	Ealing
1853		Barstow, Charles H.	Spofforth
1853		Barton, Charles	Brighton
1847		Barton, Henry	Brighton
1842		Bass, William Thomas	Enfield
1846		Bassett, Charles	Pontypridd
1853		Batchelor, Charles	Fareham
1853		Bateman, John Bird	Manchester
1861	243	Bates, James ...	Wellington
1852		Bates, John	Bicester
1850		Bates, William I.	Macclesfield

Year of Membership.	No. of Certificate.	NAME.	RESIDENCE.
1853		Bath, Richard C.	Morice Town
1842		Battle, John Richard	Lincoln
1841		Baumbrough, William	Wandsworth
1855	207	Baxter, William Walmisley	Bromley
1841		Baynes, James	Hull
1858		Baylis, Thomas	Worcester
1861	402	Beach, James	Bridport
1847		Beadon, John	Taunton
1852		Beard, James	Manchester
1842		Beardsley, John	Nottingham
1853		Beaumont, William H.	Gravesend
1847		Beckett, John	Scarborough
1846		Beech, Joseph	Atherstone
1841		Beesley, Henry	Adderbury
1844		Beesley, Thomas	Banbury
1853		Bell, Edward C.	Dudley
1857	280	Bell, Francis	Bradford
1857	168	Bell, James	Manchester
1862		Bell, William	Carlisle
1842		Bennett, George	Newark
1850		Bennett, John W.	Leigh, Lancashire
1847		Berry, Edward	Gloucester
1853		Berry, Henry James	Worthing
1853		Bettison, Joseph	Chesterfield
1853		Betts, John	Woodbridge
1847		Bevan, Charles F.	Harwich
1853		Bew, Robert	Bilston
1855	270	Biggs, Walter	Hampstead
1853		Binns, Samuel	Sheffield
1863	622	*Birch, Henry Cooper	Upper Norwood
1842		Birch, Thomas Edwards	Mold
1842		Bird, Alfred	Birmingham
1842		Bird, Charles	Worcester
1841		Bishop, Robert	Eye
1849		Bishop, Thomas	Woolwich
1853		Black, James	Leven
1842		Blackburn, Bailey	Bradford
1852		Blacklock, Henry	Bournemouth
1841		Blacklock, Joseph D.	Brighton
1845		Blackshaw, Thomas	Burslem
1842		Blades, Christopher	Leek
1846		Blades, Holland	Nantwich
1842		Blades, Sherriff	Northwich
1856		Blake, William F.	Stroud
1857		Bland, John Handel	Stourbridge
1852		*Blanshard, George	Edinburgh
1853		Blanshard, Thomas	Edinburgh
1848		Bloor, Joseph	Derby
1853		Blunt, Thomas	Shrewsbury
1842		Bolton, Thomas	Tenterden
1850		Bond, Charles	Kidderminster
1842		Bond, John	Great Yarmouth
1842		Bond, John	Minehead
1853		Bond, Laurence V.	Tiverton

Year of Membership.	No. of Certificate.	NAME.	RESIDENCE.
1848		Boocock, John	Leeds
1852	116	Boorne, Charles	Bristol
1858	499	*Booth, Henry	Rochdale
1853		Booth, James	Blackburn
1841		Booth, James	Rochdale
1842		Booth, John	Heckmondwike
1853		Booth, Nathaniel	Rotherham
1853		Booth, Thomas Buckley	Eccles
1859	332	Borland, John	Kilmarnock
1853		Bostock, William	Ashton-under-Lyne
1855	304	Botham, William	Sheffield
1842		Bottle, Alexander	Dover
1863	495	*Boucher, John	Bristol
1849		Bowen, Henry F.	Brighton
1853		Bowerbank, Fawcett	Cockermouth
1841		Bowerbank, Joseph	Cockermouth
1847		Bowers, James D.	Chester
1843		Bowers, Thomas	Chester
1853		Bowker, James	Manchester
1853		Bowles, Charles A.	Chester
1858	29	Bowman, William	York
1863	209	Boyce, George	Chertsey
1853	257	*Boyce, John Pierce	Windsor
1841		Boyce, John Pierce	Chertsey
1842		Braddock, William	Oldham
1856	411	*Brady, Henry B.	Newcastle-on-Tyne
1853		Bragg, William B.	Market Harborough
1842		Brailey, Charles	Heavitree
1849		Bramwell, George	Liverpool
1842		Brayshay, William Bolam	Stockton
1842		Brearey, William A.	Douglas
1846		Bremner, William	Thurso
1845		Brend, Thomas	Swansea
1858	272	Breton, Walter	Brighton
1858	428	*Brevitt, William Y.	Wolverhampton
1842		Brew, Thomas Archer	Brighton
1842		Brewster, William	Cambridge
1853		Brierley, Richard	Stalybridge
1842		Briggs, James	Tipton
1843		Bright, Philip	Brecon
1853		Bright, William	Bath
1842		Brocklehurst, James	Hyde
1853		Bromfield, Charles	Exeter
1853		Bromfield, William	Crewe
1848		Bromley, Charles	Liverpool
1842		Brown, Charles	Belper
1852	121	*Brown, David R.	Edinburgh
1853		Brown, George	Selby
1853		Brown, Samuel	Coningsby
1853		Brown, Thomas Dudley	Coventry
1850		Brown, Thomas	Lutterworth
1853		Brown, Thomson	Glasgow
1846		Brown, William	Dunfermline
1862	612	*Brown, William Henry	North Shields

Year of Membership.	No. of Certificate.	NAME.	RESIDENCE.
1845		Brown, William Scott	Manchester
1847		Bryant, William	Huntingdon
1853	226	Bryce, James	Dunfermline
1853		Buck, Richard C.	Dudley
1853		Bullus, William	West Bromwich
1853		Bunn, Charles	Colchester
1842		Burdon, John	Durham
1848		Burdwood, James	Plymouth
1851		Burgess, William	Northwich
1853		Burnett, Robert	Frazerburgh
1853		Burrell, George	Montrose
1853		Burrow, John Severn	Great Malvern
1852		Burrow, Walter B.	Great Malvern
1860	598	*Burton, John	Nottingham
1853		Bustin, William	Shotley Bridge
1852		Butcher, Thomas	Cheltenham
1841		Butler, Samuel	Bristol
1853		Butler, Thomas E.	Leicester
1841		Butler, William	Wycombe
1861	627	Buzzard, Thomas Hardy	Leicester
1853		Caddick, John	Newcastle-under-Lyne
1853	77	Caley, Albert Jarman	Norwich
1842		Calvert, James	Belper
1849		Calvert, Robert	Stokesley
1846		Campbell, Donald	Glasgow
1852	122	Carmichael, Lauchlan	Edinburgh
1842		Carr, William	Leicester
1841		Carr, William Graham	Berwick
1844		*Carran, Thomas	Peel, Isle of Man
1853		Carruthers, Richard Birrell	Dumfries
1850		Carter, William	Manchester
1844		Cartwright, William	Newcastle-under-Lyne
1852		Cattle, James	Liverpool
1853		Chamberlin, William	Downton
1842		Chantry, George	Goole
1846		Chaplin, Alfred	Brighton
1855	62	*Chaplin, John Lambert	Colchester
1842		Chapman, Edward	Hull
1853		Chapman, Henry	Clevedon
1853		Chapman, Henry	Ipswich
1853		Chapman, John	Tring
1841		Chapman, John Cook	Congleton
1849		Chapman, Richard J.	Chipping Ongar
1853		Chapman, William Fox	Hull
1851		Chaston, Robert	Lowestoft
1841		Chater, Jonathan	Watford
1853		Chaundy, Thomas G.	Oxford
1842		Chave, John Anstey	Uxbridge
1849		Cheshire, John	Grantham
1862	671	*Chessall, Rowland	Sidmouth
1853		Childs, James L.	Southsea
1842		Chipperfield, Robert	Southampton
1851		Christian, Francis	Birmingham
1842		Christopher, William	Crickhowell

Year of Membership.	No. of Certificate.	NAME.	RESIDENCE.
1861	583	Church, Henry James	Cambridge
1853		Churchill, John	Birmingham
1856		Churchouse, William B.	Chard
1842		Churchyard, Isaac	Brighton
1863	527	*Clark, John	Stockton-on-Tees
1845		Clark, John Webster	Leicester
1853		Clark, Robert	Devizes
1855	334	Clark, William W.	Dorking
1853		Clarke, Benjamin Joseph	Cheltenham
1841		Clarke, Joseph	York
1846		Clarke, Thomas Meadows	Richmond
1853		Clarke, William	Longsight
1860	200	Clarke, William R.	Northampton
1853		Clater, Francis	Retford
1841		Clay, Robert	Liverpool
1854	201	Clayton, John O.	Leeds
1853		Clennell, John Morton	Newcastle-on-Tyne
1849		Clift, Edward	Lewisham
1853		Clift, Joseph	Dorking
1858		Coates, John M.	Newcastle
1845		*Coates, William	Leeds
1852		Cochrane, Thomas	Falkirk
1853		Cock, John	Shipdham, nr. Norwich
1842		Cocking, George	Ludlow
1853		Cockton, John	Maryport
1841		Colbeck, George Royde	Leamington
1848		Cole, Walter Thomas	Weymouth
1853		Collier, William	Sheffield
1846		Collier, William	York
1859		Collier, William Lindsey	Reading
1849		Collings, William Henry	Bristol
1852		Colton, Thomas	Selby
1853		Commans, Robert Dyer	Bath
1853	185	Conacher, David	Markinch
1842		Conway, William	Pontypool
1843		Cooke, William	Norwich
1841		Cooper, George	Exeter
1850		Cooper, George Brown	Brightlingsea
1841		Cooper, James Newbury	Clifton
1852		Cooper, James Robert	Kenilworth
1853		Cooper, Lewis	Reading
1845		Cooper, Mark Ward	Bridlington
1841		Cooper, Thomas	Leicester
1845		Cooper, Thomas	York
1853		Corfield, Thomas J. T.	St. Day
1843		Cornelius, Richard Bussell	Teignmouth
1859	469	*Cornell, William	Ipswich
1845		Cornish, Henry Roberts	Penzance
1843		Cornish, William	Brighton
1841		Corrie, Charles	Bedford
1841		Cortis, Charles	Worthing
1853		Cotterell, William Henry	Dover
1841		Cotton, Gilbert Knill	Barnstaple
1853		Coupland, Henry	Liverpool

Year of Membership.	No. of Certificate.	NAME.	RESIDENCE.
1853		Coupland, Joseph	Harrogate
1842		Cousins, Thomas George	Oxford
1842		Coverley, John	Scarborough
1845		Cowell, Silas	Canterbury
1845		Cowgill, Brian	Burnley
1841		Crafton, Ralph Caldwell	Croydon
1853	228	Crarer, John	Blairgowrie
1853		Crick, George Edward	Maldon
1853		Cripps, John	Hammersmith
1842		Critchley, John	Blackburn
1858		Crocker, Edwin	Plymouth
1842		Crocker, Henry Radcliffe	Brighton
1853		Crofts, Holmes Cheney	Chatham
1842		Cronshey, James	Thetford
1841		Crook, George	Farnham
1853		Croskell, Charles	York
1847		Cross, William Gower	Shrewsbury
1858	432	*Cross, William	Cardiff
1853		Crowder, Charles H.	Barton-on-Humber
1846		Crowther, Thomas	Tickill
1851		Cuff, Robert C.	Bristol
1852		Cumbers, John	Wandsworth
1853		Cumine, Frederick H.	Southport
1841		Cupiss, Francis	Diss
1853		Currie, John	Glasgow
1863	693	Curtis, William	Barnstaple
1854	273	Cuthbert, John Mason	Bedford
1863	470	Cutting, James	Leamington
1842		Cutting, James Bray	Leamington
1848		Cutting, Thomas	Selby
1842		Dale, George	Chichester
1844		Dale, William James	Portsea
1855		Dance, William D.	Stourport
1853		Dandie, David	Perth
1855	126	Dandie, Robert	Perth
1850		Davenport, Edward	St. Albans
1853		Davidson, Charles	Aberdeen
1846		Davidson, John	Berwick
1861	552	*Davies, David	Cardigan
1853		Davies, John L.	Hay
1853		Davies, Peter Hughes	March
1842		Davies, Richard Morgan	Carmarthen
1853		Davies, William Henry	Birmingham
1856		Davis, D. Frederick	Leominster
1842		Davis, Francis	Newbury
1841		Davis, Henry	Leamington
1841		Davis, John	Dorchester
1848		Davis, John Oliver	St. Leonards
1859	282	Davis, Richard Hayton	Harrogate
1841		Davis, Robert	Dorchester
1845		Davison, Ralph	York
1854		Dawe, Sampson	Monmouth
1853		Dawson, Thomas	Preston
1853		Day, George	Blackheath

Year of Membership.	No. of Certificate.	NAME.	RESIDENCE.
1853	194	Deck, Arthur	Cambridge
1845		Dennison, Matthew	Dudley
1860	523	*Deighton, Thomas Milner	Bridgnorth
1863	564	*Delf, Frederick Daniel	Liverpool
1852		Dewar, Peter James	Dingwall
1842		Dexter, James	Eastbourne
1842		Dickerson, Henry	Devonport
1845		Dickins, Rowland	Aylesbury
1847		Dingley, Richard Loxley	Evesham
1858	460	*Dixon, Henry	Ryde, Isle of Wight
1854	381	*Dixon, William	Southampton
1842		Dobinson, William	Sunderland
1853		Dobson, James	Keswick
1858		Dobson, John	Newcastle-on-Tyne
1847		Dodman, Robert	Thorney
1842		Dodshon, Edward	Sunderland
1852		Done, John	Manchester
1846		Doubell, James	Broadstairs
1855		Doughty, Richard	Bushey
1842		Dowell, William Cuming	Bristol
1845		Dowman, George	Southampton
1847		Down, Richard Haydon	Torpoint
1853		Downes, Joseph	Lower Mitcham
1847		Downing, Joseph G.	Braintree
1852		Dowthwaite, William	Towcester
1841		Drage, William F.	Birmingham
1841		Dresser, Richard	York
1841		Duck, Daniel	Guisborough
1846		Dudden, Richard M.	Midsomer Norton
1852		*Dudgeon, George	Nottingham
1842		Duggan, Henry Stephen	Hereford
1842		Duncan, Frederick McRae	Sandwich
1841		Duncan, John	Edinburgh
1853	184	Duncan, William	Rothesay
1842		Dunhill, William	Doncaster
1861	539	*Dunhill, William Workman	Doncaster
1861	500	Dunn, James	Newcastle-on-Tyne
1853		Duprey, Jean A. B.	Jersey
1853		Durant, Frederic	Dorking
1842		Dutton, George	Bolton
1847		Dutton, John	Rock Ferry
1853		Dyer, John	Margate
1853		Dyer, William	Halifax
1842		Dymond, George	Birmingham
1842		Dyson, John	Andover
1861	568	*Earle, Francis	Hull
1853		Eastes, Thomas Henley	Dover
1853		Edgar, James	Henley-on-Thames
1859	324	Edman, Bonner	Henley-on-Thames
1853		Edmonds, Benjamin M.	Lowestoft
1842		Edwards, George	Dartford
1850		Edwards, Henry	Lincoln
1848	22	*Edwards, John Baker	Liverpool
1853		Edwards, William	Denbigh

Year of Membership.	No. of Certificate.	NAME.	RESIDENCE.
1853		Edwards, William	Hastings
1861	628	*Edwards, William	Much Wenlock
1863	645	*Ekin, Charles	Bath
1853		Ekins, William	Huntingdon
1842		Eliott, Samuel	Liskeard
1842		Ellaby, John	Melton Mowbray
1862	618	*Elliott, Robert	Gateshead
1842		Ellis, Benjamin	Shepton Mallett
1849		Ellis, Richard	Thornbury
1853		Ellis, William	Abergele
1856	258	*Elsey, Charles	Maldon
1845		Elsey, John	Horncastle
1847		Ely, George	Bingham
1843		*England, William Paul	Huddersfield
1853		Ereaut, George	Jersey
1848		Ereaut, John	Jersey
1860	553	*Ereaut, John, jun.	Jersey
1860	493	Essery, William	Plymouth
1842		Evans, Edward	Liverpool
1858	211	Evans, Evan	Aberavon
1854	47	Evans, Henry S.	Liverpool
1842		Evans, John	Hemel Hempstead
1853		Evans, John	Narberth
1853		Evans, Samuel	Caerphilly
1847		Evans, Thomas	Aberdare
1851	43	Evans, Thomas	Liverpool
1842		Evans, Thomas B.	Liverpool
1853		Evans, William Luke	Cardiff
1842		Eyre, Alfred B.	Ipswich
1862	462	Eyre, Joshua J.	Manchester
1849		Eyre, Thomas S.	Launceston
1844		Fairbank, James Hack	Woolwich
1853	361	Fairbarn, George	Liverpool
1853		Fairley, Thomas	Sunderland
1853		Falkner, Richard	Banbury
1847	26	Farmer, James	Castle Donnington
1842		Farmer, John	Putney
1853		Farnworth, William	Blackburn
1853		Farrage, Robert	Rothbury
1850		Farrant, Henry	Ottery St. Mary
1842		Farrant, Robert	Salisbury
1854	99	Farrer, John Daniel	Chester
1853		Farrow, William	Woburn
1842		Fergusson, John	Liverpool
1842		Fielder, Thomas	Warminster
1842		Finch, John	Cheltenham
1852		Finlayson, Thomas	Leith
1851		Fisher, John Thornhill	Torquay
1853		*Fisher, Henry Christopher	Torquay
1853		Fiske, Charles	Ipswich
1843		Fitch, Robert	Norwich
1842		Fitt, Edward	Barking
1841		Fleeming, William	Wolverhampton
1842		Fletcher, Francis	Cheltenham

Year of Membership.	No. of Certificate.	NAME.	RESIDENCE.
1841		Flockhart, William	Edinburgh
1853		Flower, Thomas S.	Cheshunt
1842		Foggitt, Thomas Jackson	Thirsk
1841		Forbes, William	Reigate
1853		*Forge, Christopher	Bridlington
1853		Forman, George	Birmingham
1853		Forrest, Richard William	Gainsborough
1853		Forster, John	Whitehaven
1845		Forster, Robert	Dover
1853		Foster, Alfred Hood	Birmingham
1842		Foster, Edward	Ludlow
1841		Foster, Frederick	Brighton
1855		Foster, George Pitt	Tetbury
1845		Foster, James Fawcett	Hull
1853		Foster, John	Uckfield
1842		Foulds, William	Chowbent
1859	421	*Fouracre, Robert	Taunton
1853		Fowler, Edward	Bedale
1853		Fowler, Henry	Torrington
1849		Fox, Charles James	Witney
1853		Foxcroft, Elijah	Skipton
1853		Franks, Alfred	Ramsgate
1853		Fraser, Charles	Largs
1853		Frazer, Daniel	Glasgow
1853		Freeland, John	Barrhead
1844		Freestone, Thomas Morris	Bristol
1841		French, Gabriel	Chatham
1853		Fresson, Lewis Francis	Stevenage
1862	641	*Frost, George	Derby
1851		Frost, William Henry	Collumpton
1841		Fryer, Henry	Huddersfield
1849		Furmston, Samuel C.	Wycombe
1863	53	Furze, Henry	Forest Hill
1853		Gall, Benjamin D.	Woodbridge
1842		*Gamble, Richard	Grantham
1853		Gammidge, Samuel	Leicester
1841		Garbutt, Cornelius	Gateshead
1853		Garbutt, Cornelius D.	Gateshead
1842		Gardener, Charles	Tunbridge Wells
1841		Gardner, James	Edinburgh
1841		*Garle, John	Bromley, Kent
1853		Garlick, John	Hollinwood
1846		Garlick, Thomas H.	Halifax
1851		Garnham, Barrington	Brighton
1842		Garratt, John Colpman	Rugby
1856		Garratt, Samuel	Rugby
1842		Garside, Francis Burdett	Southport
1842		Gay, George	Stroud
1846		Geldard, John	St. Austell
1842		Geldard, Richard Kelly	Plymouth
1862	650	*George, John Evan	Hirwain
1861	403	Gibbons, George	Weston-super-Mare
1841		Gibbons, William	Plymouth
1852		Gibbs, William	Ryde

Year of Membership.	No. of Certificate.	NAME.	RESIDENCE.
1851		Gilbert, George	Portsea
1841		Giles, Richard Bobbett	Clifton
1847	37	*Giles, Richard William	Clifton
1859	471	*Gill, Hugh	Halifax
1842		Gill, Samuel	Pendleton
1842		Gill, William	Tavistock
1841		Gilkes, William	Leominster
1856	433	Gissing, Thomas W.	Wakefield
1844		Glaisby, John	York
1841		Glaisyer, Thomas	Brighton
1852	71	Glanfield, George	Torquay
1859	458	*Glass, John T.	Cheltenham
1853		Glew, William	Selby
1850		Glover, Samuel	Liverpool
1841		Gloyne, Thomas Hadfield	Dewsbury
1858		Glyde, John William	Blandford
1845		Goddard, Henry Edward	Yarmouth
1842		Goddard, Joseph	Leicester
1850		Goodall, Henry	Derby
1842		Goodall, Thomas	Eynsham
1857	79	Goode, Charles	Congleton
1857		*Goodwin, John	Lower Clapton
1842		Gordelier, Paul William Gibbs	Sittingbourne
1853		Goss, Samuel	Barnstaple
1853		Gostling, Thomas P.	Diss
1853		Gould, Frederick	Kingston-on-Thames
1855	132	Govan, Alexander	St. Andrews
1841		Gow, Alexander	Wolverhampton
1857		Granger, Edwin John	Upper Clapton
1852	130	Gray, Alexander F.	Edinburgh
1853		Gray, Charles	Bilston
1848		Gray, William	Rothwell
1853		Greaves, Abraham	Ironville
1844		Greaves, John	Bakewell
1842		Greaves, Richard	Ripon
1853		Green, George	Selby
1854	245	Green, James	Droitwich
1848		Green, John	Birkenhead
1863	446	*Green, John	Deal
1853		Green, Robert Poynton	Witham
1849		Greenwell, William C.	Gateshead
1848		Greenwood, John	Harrogate
1861	609	*Gregory, George Henry	Taunton
1853		Greig, William	Glasgow
1846		Griffith, Richard	Slough
1852		Griffith, Robert	Carnarvon
1861		Griffiths, Benjamin	Tredegar
1853		Griffiths, William	Swansea
1855	18	*Grindley, Robert D.	Chester
1853		Groom, William Bishop	Liverpool
1852		Grounds, George Field	Bishop Stortford
1853		Groves, Edward	Hammersmith
1853	103	Groves, Thomas Bennett	Weymouth
1854	95	Groves, Wellington E.	Blandford

Year of Membership.	No. of Certificate.	NAME.	RESIDENCE.
1853		Gudgen, George B.	Kimbolton
1842		Gulliver, Walker Job	Lutterworth
1841		Gurnell, Thomas	Dartford
1846		Guy, Guy	Helston
1860	369	Guyer, James Brett	Torquay
1841		Gwatkin, James Thomas	Brighton
1852		Gwillim, John Cole	Malvern Link
1853		Hackman, Leonard L.	Landport
1853		Hadfield, John	Congleton
1841		Hadfield, William	Congleton
1853		Hadfield, William P.	Newark
1852		Haigh, Joseph	Leeds
1842		Haines, John Jenkins	Bromsgrove
1842		Hall, George	Huddersfield
1853		Hall, Henry R. F.	Hull
1842		Hall, John Dean	Wycombe
1852	4	Hall, John Richard	Canterbury
1843		Hall, Joseph	Salford
1853		Hall, Richard	Brecon
1853		Hall, Robert	Camborne
1849		Hall, Thomas	Grantham
1853		Hall, Thomas	Newcastle-on-Tyne
1849		Hallam, Edward	Axbridge
1859	536	Hallaway, John	Carlisle
1860	434	*Halliday, William Jabez	Manchester
1842		Hallsworth, Thomas	Manchester
1853		Ham, John	Nether Stowey
1857		Hambrook, John B.	Dover
1841		Hambrook, Odden	Dover
1858		Hamilton, John T.	Dublin
1853		Hamilton, Julius	Poole
1846		Hammon, Richard	Folkestone
1855	383	Handley, John	Wakefield
1853		Hannell, Edward W.	Rugby
1853	230	Hardie, James	Dundee
1853		Harding, James John	Sudbury
1853		Hardman, Thomas B.	Liverpool
1853		Hare, Josiah William	Harleston
1852		Hargraves, Henry L.	Oldham
1842		Harold, William	Battle
1842		Harper, Henry	Leamington
1852		Harrington, Arthur	Rochford
1853		Harrington, Richard B.	Rayleigh
1842		Harris, George	Stamford
1854	203	Harris, William Harry	Northampton
1842		Harrison, James Parker	Carlisle
1853		Harrison, Thomas	Leeds
1842		Harrison, Thomas	Bradford
1847		Harrison, Thomas	Nottingham
1842		Harsant, William	Epsom
1853		Hart, George William	Hull
1852		Hart, Hugh	Glasgow
1848		Hart, James	Bolton
1841		Hartland, James	Bristol

Year of Member-ship.	No. of Certificate.	NAME.	RESIDENCE.
1863	563	*Hartley, William	Congleton
1853		Hartshorn, William H.	Ironbridge
1843		Harvey, John	Newark
1841		Harvey, Thomas	Leeds
1842		Haselar, Albert	Cranbrook
1861	632	*Hasselby, Thomas John	Goole
1848		Hatfull, Robert	Deptford
1853		Hatrick, Robert R.	Paisley
1853		Hatrick, William	Paisley
1853		Hawkins, Henry Ford	Rugeley
1847		Haydon, Frederick Walter	Fordingbridge
1842		Haydon, Henry William	Tiverton
1857	447	*Hayes, James	Great Warley, Essex
1853		Hayman, Alfred	Neath
1853		Hayward, Charles	Manchester
1859	541	*Hayward, Charles John	Lincoln
1845		Hayward, Edward	Ipswich
1853		Hayward, Samuel Henry	Gloucester
1845		Hayward, William G.	Reading
1842		Head, John	Lewes
1842		Headley, Morris	Bridlington Quay
1846		Heald, William	Sleaford
1845		Heathcote, Thomas Sarl	Newcastle-under-Lyne
1847		Heaton, John Scholes	Manchester
1842		Hellowell, Daniel	Leeds
1853	285	Heming, Robert	Sunderland
1848		Hempsted, Robert	St. Leonards
1853		Henderson, John	Glasgow
1853		Henley, Henry	Lyme Regis
1853		Henshall, John	Congleton
1841		Henson, Matthew	Dunstable
1853		Henthorn, Joshua	Oldham
1853		Herington, Joseph	Leighton Buzzard
1845		Hern, William Henry	St. Austell
1853		Hewlins, Edward	Leatherhead
1862		Heynes, John	Capetown, Cape of Good Hope
1842		Hibbert, Walter	Neath
1846		Hick, Allan	Wath-upon-Dearne
1845		Hick, Joseph	Bradford
1845		Hick, Matthew Bussey	Wakefield
1842		Hickman, Joseph Frederick	Newbury
1853		Hicks, George	Rothesay
1853		Hifley, Richard James	Devonport
1853	96	Higgins, Thomas S.	Huddersfield
1843		Higgins, William	Chester
1842		Highway, Henry	Walsall
1841		Hill, John	Sheffield
1842		Hill, Richard	Bruton
1853		Hill, Simon	Plymouth
1854	246	Hill, Thomas	Norwood
1853		Hill, William	Manchester
1853		Hinchliffe, Ferrand G. U.	Manchester
1853		Hinds, James	Coventry
1853		Hine, Alfred	Beaminster

Year of Membership.	No. of Certificate.	NAME.	RESIDENCE.
1858		Hingston, Andrew H.	Liverpool
1842		Hitchcock, Charles Edmund	Oxford
1853		Hobson, Charles	Beverley
1847		Hodder, Henry	Bristol
1853		Hoddy, Benjamin	Halstead
1852	133	Hodgeton, David	Brechin
1841		Hodgson, Edward	Stockton
1853		Hodkinson, Henry	Macclesfield
1853		Hogg, Henry	Bristol
1853		Hogg, Thomas	Bideford
1853		Holden, Richard	York
1853		Holdsworth, Thomas W.	Birmingham
1854		Holland, William	Market Deeping
1841		Hollier, Elliott	Dudley
1843		Holt, George Palmer	Bexley Heath
1853		Holt, Richard Wylde	Seacombe
1853	13	Hooker, Thomas E.	Wellington
1842		Hooper, Henry	Brighton
1853		Hopper, Richard	Sunderland
1841		Hopwood, Henry J. S.	Richmond, Surrey
1860	401	Hopwood, Thomas S.	Richmond, Surrey
1841		Horncastle, Henry	Sheffield
1841		Horner, Stephen	Hartlepool
1857	174	Hornsby, George G.	Cheltenham
1845		Hornsby, John Harwood	Odiham
1853		Horsey, James	Portsea
1851		Houghton, James	Liverpool
1853		Houghton, Thomas	Oxford
1859	448	*Houghton, William	Preston
1856	214	Houlton, James	Wetherby
1842		Howard, John	Manchester
1853		Howard, John Eliot	Stratford-le-Bow
1853		Howard, Richard	Tunbridge Wells
1841		Howard, Robert	Stratford-le-Bow
1842		Howman, Philip	Winchcombe
1846		Howorth, James	Doncaster
1851		Howson, Thomas B.	Oxford
1855		Howson, Thomas J.	Gateshead
1853		Hubbard, Robert William	Kenilworth
1842		Hudson, Richard	Kendal
1851	10	Huggins, George Thomas	Barnet
1849		Hughes, Edward	Altrincham
1842		Hughes, Samuel	Stourbridge
1842		Hulbert, Robert Skeat	Basingstoke
1853		Hulme, John Hughes	Norwich
1853		Hulme, Thomas	Oldham
1842		Humphreys, Matthew	Nottingham
1842		Humphreys, Thomas	Birmingham
1855	104	*Hunt, Richard	Winchester
1851		Hunt, Thomas	Sunderland
1853	135	Hunter, David	Edinburgh
1853		Hunter, John	Gosport
1842		Huntley, John	Wimborne
1855		Hurdon, James	Appledore

Year of Membership.	No. of Certificate.	NAME.	RESIDENCE.
1853		Hurman, John	Bridgewater
1842		Hurst, John	Louth
1844		Hurst, William F. H.	
1842		Husband, Matthew	Exeter
1861	619	Hustwick, Thomas H.	Hereford
1860	497	*Icke, Henry Scott	Gloucester
1853		Iliffe, Thomas	Nuneaton
1853		Ingham, Henry	Wellingore
1853		Ingham, Richard H.	Manchester
1853	306	Isaac, George Washington	Clifton
1861	476	*Iverach, John G.	Kirkwall
1852		Iverach, William	Kirkwall
1854	136	Jaap, John	Glasgow
1853		Jackson, Henry	Liverpool
1841		Jackson, Thomas	Manchester
1852	105	Jackson, William	Crediton
1842		Jackson, William George	Hartlepool
1842		James, John	Truro
1853		James, John Parry	Cardiff
1853		Jameson, Walter C.	Bath
1855	298	Jefferson, Ebenezer W.	Tottenham
1853		Jefferson, Peter	Leeds
1853		Jeffrey, Russell	Cheltenham
1853		Jenkins, John	Peterchurch
1862		Jenkins, Joseph	Nottingham
1859		Jenner, William M.	Sandgate
1855	286	Jennings, John Edgell	Southampton
1844		Jennings, John E. H.	Sheffield
1842		Jennings, Reginald	Hereford
1841		Jennings, William	Halifax
1853		Jessop, Jonathan	Halifax
1852		Jobson, William	Dundee
1858	390	Johnson, George	Birmingham
1853		Johnson, John B.	Uttoxeter
1841		Johnson, John H.	Liverpool
1841		*Johnson, Samuel	Liverpool
1853		Johnson, Thomas	Leek
1848		Jones, Charles	Birkenhead
1841		Jones, Charles	Hanley
1863	578	Jones, Charles William	Carmarthen
1853		Jones, David	Narbeth
1842		Jones, Edward Bowen	Carmarthen
1853		Jones, Ellis Powell	Rhyl
1859	465	Jones, Humphrey	Llangollen
1847		Jones, James	Newcastle-on-Tyne
1848		Jones, James	Salford
1853		Jones, John	Aberdare
1845		Jones, John	Holywell
1853		Jones, Owen Lewis	Liverpool
1845		Jones, Samuel Urwick	Leamington
1853		Jones, Thomas	Welshpool
1853		Jones, Thomas J.	Newport
1842		Jones, William	Hastings
1842		Jones, William	Liverpool

Year of Membership.	No. of Certificate.	NAME.	RESIDENCE.
1841		Jones, William B.	Kingston-on-Thames
1853		Jones, William Thorpe	Southwell
1863	340	*Jones, Williams Withers	Bristol
1857	115	*Joy, Francis William	Cardiff
1859	473	Judd, William	Christchurch
1842		Judson, Thomas	Ripon
1846		Jull, Thomas	Horsham
1852		Keene, Alfred	Leamington
1853		Keith, James	Aberdeen
1852	137	Kemp, David	Portobello
1861	418	Kemp, David Skinner	Bombay
1841		Kemp, Grover	Brighton
1854		Kemp, John	Brighton
1848		Kemp, William	Horncastle
1841		Kendall, Frederick	Stratford-on-Avon
1844		Kendall, George	Masham
1853		Kennedy, William	Glasgow
1853		Kent, Alfred	Basingstoke
1861	601	*Kent, Frederick William	Bath
1853		Kernick, Samuel Penrose	Cardiff
1843		Kernot, Joseph	Naples
1843		Kernot, Septimus	Naples
1847		Kershaw, James	Southport
1841		Kimbell, Henry	Knowle
1852		Kinder, John	Glossop
1853		King, Charles Montague	Southend
1853		King, Ellis	Southend
1842		King, Joseph Raymond	Bath
1841		King, Thomas Simmons	Rochester
1853		King, William	Soham
1853		King, William George	Market Drayton
1858	234	Kinninmont, Alexander	Glasgow
1853		Kirk, Charles	Hartley Row
1854	276	Kirk, John	Maidstone
1853		Kirk, Thomas	Liverpool
1853		Kirkbride, William	Penrith
1859	299	Kirkman, George B.	Stamford
1842		Kirton, Joseph Bishop	Hull
1842		Kitching, Charles	Haverhill
1853		Knapman, John	Exeter
1843		Knight, Alfred	Margate
1858		Knight, John	Cambridge
1854		Knight, Joseph	Bath
1863	667	*Knights, John Atmore	Norwich
1841		*Knott, Thomas	
1844		Knowles, Richard John	Demerara
1852		Knowles, John J.	Sandwich
1853	187	Laird, William	Dundee
1853		Lamotte, Thomas Gallye	Bristol
1853		Lancaster, Henry	Croydon
1853		Lane, Joseph	Hampstead
1842		Langford, William	King's Lynn
1858	100	Laugman, Peter	Chatteris
1843		Lansdale, Ralph	Wycombe
1853		Lasham, John	Romford

Year of Membership.	No. of Certificate.	NAME.	RESIDENCE.
1841		Lathbury, Robert	Liverpool
1842		Lavers, Thomas Howard	Blackheath
1853		Law, William	Forfar
1859	183	*Lea, Charles Wheeley	Worcester
1842		Lea, Henry Clairmont	Hastings
1841		Lea, John Wheeley	Worcester
1853		Lea, Samuel	Ellesmere
1853		Leach, John	Crawley
1855		Leadbetter, William Austin	Melton Mowbray
1841		Leay, Joseph	Chilcompton
1853		Leighton, John H.	Durham
1852	138	Leith, James	Edinburgh
1853	83	Lever, William	Hastings
1853		Lewin, Edward C.	Boston
1841		Lewin, William	Plymouth
1856	310	Lewis, Thomas Cooper	Rugby
1842		Lidington, George	Bilston
1857		Limon, Henry	Burgh
1847		Lindo, Benjamin	Dover
1841		Lindsay, Robert	Edinburgh
1841		Lines, George	Hertford
1849		Linsley, Thomas	York
1844		Lister, George	Cottingham
1854	215	Littlefield, James Wavell	Ventnor, Isle of Wight
1842		Lloyd, Edmund	Richmond, Surrey
1856	436	Lloyd, Henry	Richmond, Surrey
1853		Lloyd, Henry	Deptford
1853		Lock, William	Boston
1846		Lockyer, George	Deptford
1841		Lofthouse, James	Hull
1853		Loggin, Charles Frederick	Stratford-on-Avon
1862	585	Long, Alfred Thorby	Bognor
1858	479	Long, Henry	Croydon
1859		Long, William Elliot	Chichester
1853		Longfield, Joseph	Leeds
1853		Longrigg, John	Appleby
1853		Lord, Charles	Todmorden
1853		Lord, Ellis	Rochdale
1841		Lovett, John	Gloucester
1853		Lowe, Charles	Surbiton
1841		Lowe, Thomas	Liverpool
1842		Lowndes, Hervey	Stockport
1841		Loye, Philip	Plymouth
1853		*Luff, William	Oxford
1853		Lumsden, James	Peterhead
1842		Lynch, John R.	Manchester
1842		Mabson, William	Great Yarmouth
1852	139	Macfarlane, Wardlaw	Edinburgh
1853		McDiarmid, John B.	Deal
1841		Mackay, John	Edinburgh
1852	141	Mackenzie, Duncan	Edinburgh
1852		Macintosh, Archibald	Rothesay
1841		Maddock, William	Tunbridge Wells
1863	557	*Madgwick, William Butler	Andover
1853		Madge, James C.	Devizes

Year of Membership.	No. of Certificate.	NAME.	RESIDENCE.
1848		*Maggs, Samuel Blount	St. Leonards
1845		Maggs, Thomas C.	Yeovil
1845		Maleham, Henry	Sheffield
1862		Manby, George	Southampton
1842		Manfield, John W.	Salford
1853		Manifold, John J.	Weaverham
1859		Mann, Robert	Newcastle-on-Tyne
1841		Manthorp, Samuel	Colchester
1850		March, William	Newark
1845		Marder, James Wood	Lyme Regis
1857	481	*Maries, Henry Davies	Watford
1846		Marks, George	Bradford-on-Avon
1853		Marlor, Jabez	Lees, near Oldham
1849		Marrison, George O. R.	Tasmania
1845		Marsden, Joseph	Middleton-on-Tees
1842		Marsh, William M.	Sevenoaks
1842		Marshall, John Ferris	Gainsborough
1853	311	Marshall, Robert	Boston
1842		Marshall, James A.	Waltham Abbey
1841		Martin, John	Bristol
1842		Martin, Edward W.	Guildford
1845		Martin, Thomas	Lewes
1853		Martin, Thomas	Liverpool
1851		Martin, Henry G.	St. Albans
1853		Martyn, John Jones	Brighton
1842		Maskery, Samuel	Liverpool
1853		Mason, Joseph W.	Cirencester
1853		Mason, William	Hastings
1842		*Mason, William W.	Painswick
1853		Mather, William	Manchester
1853		Maunder, Alexander	Weston-super-Mare
1848		Maunder, Frederick	Sheffield
1853		Mawson, John	Newcastle-on-Tyne
1848		Maynard, Henry Robert	Brandon
1842		Mays, Robert James John	South Shields
1843		Meadows, John	Leicester
1842		Mease, Solomon	North Shields
1853		Mease, Robert D.	North Shields
1842		Meatyard, Robert	Basingstoke
1842		Medcalf, Benjamin	Ware
1843		Medcalf, Ebenezer	Lower Tooting
1853		Medd, Joseph	Gloucester
1857	215	Medley, William	Derby
1845		Medwin, Aaron	Blackheath Road
1853		Melhuish, John	Crediton
1862	392	Mercer, Nathan	Liverpool
1859	507	*Mercer, Nicholas	Fairfield
1853		Meredith, Edwin Richard	Bristol
1850		Merrick, Thomas J.	Northampton
1853		Merryweather, Charles	Leicester
1854	106	*Metcalfe, Christopher L.	Hull
1861	621	*Metcalfe, John Sykes	Preston
1853		Millais, Thomas	Jersey
1842		Miller, Charles	Oxford

Year of Membership.	No. of Certificate.	NAME.	RESIDENCE.
1843		Miller, Robert P.	Reading
1853		Miller, William Henry	Sheffield
1847		Mitchell, John	Manchester
1862	605	*Mohun, Martin	Ramsgate
1842		Mole, William Tingey	St. Neots
1863	579	*Moon, William Henry	Ilfracombe
1853		Morgan, William	Pillgwinlly
1844		Morris, Alfred Philip	Stourbridge
1844		*Morse, George	Mortlake
1844		Morton, George	Stratford-le-Bow
1845		Morton, Henry	Ramsgate
1853		*Morton, Jamieson	Ramsbottom
1852		Morton, John	Durham
1849		Moss, William	Carlisle
1842		Mount, John	Manchester
1853		Mount, William	Canterbury
1853		Mousley, William	Redditch
1847		*Mumbray, Robert Goodwin	Richmond, Surrey
1853		Mumby, Charles	Gosport
1853		Munday, Edward Smith	Worthing
1853		Murdoch, David	Falkirk
1852		Murdoch, George	Glasgow
1849	63	Murdoch, James	Glasgow
1841		Muriel, Harry Brooke	Brighton
1842		Muskett, James	Harleston
1844		Musson, Telemachus G.	Birmingham
1848		Naftel, Thomas P.	Guernsey
1842		Napier, James	Edinburgh
1853		Narracott, Henry	Torquay
1842		*Negus, Samuel	Northampton
1853		Newbery, Henry	Biggleswade
1853		Newby, William Henry	Perth
1853		Newcome, John	Grantham
1854		Newman, Robert	Bewdley
1845		Newman, Thomas	Hartley Row
1853		Newman, Walter F.	Falmouth
1853		Newton, George	Newcastle
1853		Nicholas, John	Narberth
1841		Nicholls, James	Stourbridge
1861	513	Nicholson, John Joseph	Sunderland
1852		Nicol, George	Pulteney Town
1845		Nind, George	Wandsworth
1853		Nix, John K.	Billericay
1841		Noakes, Richard	Brighton
1858	522	Noble, Alexander	Edinburgh
1862	580	*Norrish, James	Wandsworth
1846		Northcroft, Jonathan	Plymouth
1853		Norwood, Thomas	Hastings
1842		Oakey, Joseph Malpas	Preston
1853		Oldham, William Thomas	Wisbeach
1853		Oliver, John	Liverpool
1862	637	*Olliver, George Edward	Cranley
1842		Orange, John	Portsea
1842		Overbury, Henry	Alcester

Year of Membership.	No. of Certificate.	NAME.	RESIDENCE.
1845		Owen, Griffith	Caernarvon
1842		Owen, William	Newcastle-on-Tyne
1845		Owles, James	Bungay
1842		Owles, John	Yarmouth
1842		Paine, William	Canterbury
1841		Palk, Edward	Southampton
1841		*Palk, John	Exeter
1853		Palmer, Charles Fielding	Birmingham
1847		Palmer, Faithful	Cheltenham
1842		Palmer, Thomas J.	East Grinstead
1842		Parker, Edward	Carlisle
1853		Parker, John	Birmingham
1853		Parker, Matthew	Bath
1841		Parker, Thomas	Halifax
1853		Parker, William Henry	Nottingham
1853		Parkes, John C.	Woolwich
1854	312	*Parkes, John P.	Manchester
1842		Parkes, Joseph	Atherstone
1857	155	Parkinson, Robert	Bradford
1842		Parkinson, Thomas	Liverpool
1841		*Parnell, John	Peterborough
1842		Parsons, Edward	Barnstaple
1850		Parsons, William	Portsmouth
1853		Pasmore, George	Portsmouth
1853		Pate, Henry Thomas	Ely
1853		Paterson, William	Aberdeen
1858	453	*Patterson, Douglas John	Mansfield
1853		Patterson, George	Stamford
1853		Pattinson, Richard John	Carlisle
1841		Paul, Horace	Halstead
1853		*Paulden, William	Altrincham
1841		Payne, Reuben Craven	Bridgewater
1854	314	Peake, Henry	Dover
1855	313	Peake, James	Walmer
1842		Pearce, Thomas	Gloucester
1853		Pearman, Henry	Newport, Monmouth
1842		Pearson, Charles James	Swansea
1842		Peart, David	Ewell
1842		Peat, Walter	Fareham
1853		Pegg, Herbert	Birmingham
1852		Penney, William	Poole
1853		Penrice, Joseph	Workington
1851		Peppercorn, Benjamin	Lincoln
1855		Perfect, George	Portsea
1841		Perrins, William	Worcester
1843		Perry, Solomon	Tavistock
1853		Pertwee, Alfred R.	Chelmsford
1853		Pertwee, Edward	Romford
1852		Phillips, Edward James	Newport, Monmouth
1853		Phillips, John	Newport, Monmouth
1853		Phillips, John	Birmingham
1856	326	Phillips, William Thomas	Carmarthen
1853		Pickering, Atkinson	Hull
1842		Pickering, Henry	Leicester

Year of Membership.	No. of Certificate.	NAME.	RESIDENCE.
1841		Pickup, John	Manchester
1845		Pickup, Thomas Hartley	Blackburn
1848		Pickup, Varey	Salford
1859	301	*Picnot, Charles	Strood
1853		Pidgeon, John	Taunton
1841		Pierce, Edward Lloyd	Shelton
1853		Pilley, John	Boston
1853		Pilley, Samuel	Boston
1853		*Piquet, John	Jersey
1853		Pissey, William	Rayleigh
1853		Pitts, Robert Christopher	Norwich
1859	289	Place, William Thomas	Wakefield
1853		Player, Edmund	Bristol
1842		Plomley, James Foulis	Rye
1842		Pocklington, James	Sydenham
1862	642	*Poll, William Sheppard	Yarmouth
1852		Ponting, Thomas Cadby	Bristol
1845		Pooley, John Carpenter	Bath
1846		Portway, John	Bury St. Edmunds
1853		Potts, Thomas	Newcastle-on-Tyne
1855		Poulton, John	Newton Abbot
1842		Powell, Edward	Winchester
1852		Powell, Frederick W.	Leith
1842		Powell, John	Shaftesbury
1852		Power, Edward	Walton-on-Thames
1862	655	*Pratt, Henry	Shipston-on-Stour
1841		Pratt, John	Chichester
1846		Pratt, John	Bradford
1853		Pratt, Richard Munton	Otley
1853		Priestlay, Henry	Pontefract
1852		Prince, Henry	Taunton
1855	290	*Pring, Walter	Taunton
1855		Prior, George T.	Oxford
1842		Prockter, Richard Edgcumbe	Cheltenham
1853		Procter, Joseph	Beverley
1841		*Procter, William	Settle
1857	248	Proctor, Barnard S.	Newcastle
1848		Proctor, William	Newcastle
1841		Proctor, William B.	Newcastle
1859	384	*Prosser, Thomas Evan	Colchester
1852	141	*Prott, William	Hunctly
1842		Prout, Robert	Milton Abbot
1853		Pryer, William Symes	Axminster
1852		Pullin, Edward	Northampton
1841		Purdue, Thomas	Witney
1855	355	*Pyne, Joseph J.	Manchester
1851		Radford, Isaiah C.	Devonport
1841		Radley, William Valentine	Sheffield
1842		Raimes, Richard	Edinburgh
1854	302	Rainey, Edward	Spilsby
1853		Rait, Robert C.	Partick
1853		Ralfs, Henry Charles	Brentford
1841		Ramskill, Parsons	Leeds
1841		Randall, Edward Mayor	Southampton

Year of Membership.	No. of Certificate.	NAME.	RESIDENCE.
1853		Randall, Thomas	Wareham
1845		Randall, William Brodribb	Southampton
1853		Randleson, William	Whitehaven
1853		Ranken, James Anderson	Forfar
1848		Rankin, William	Kilmarnock
1853		Ransom, William	Hitchin
1853		Ransome, Thomas	Manchester
1851		Rastrick, George T.	Geelong
1842		Rastrick, John Alfred	Woolwich
1842		Rastrick, Joseph Linington	Southsea
1853		Rastrick, William Henry	Portsea
1853		Rawdin, Joseph	Jedburgh
1841		Rawle, William	Melbourne
1854	206	Rayner, John	Nottingham
1852		Rayner, John	Uxbridge
1859	543	*Rayner, John Charles	Uxbridge
1859	408	Rayner, William	Sheerness
1842		Reading, Richard Grant	Warwick
1841		Readman, William	Leighton Buzzard
1842		Redfern, John	Ashby-de-la-Zouch
1853		Redmayne, Christopher	Warrington
1853		Rees, William Henry	Dartmouth
1853		Reid, David	Aberdeen
1853		Reid, John	Montrose
1857	251	Reid, Neil	Perth
1856		Reilly, William Charles	Hampstead
1841		Reinhardt, George	Leeds
1845		Reinhardt, Johann Christian	Leeds
1848		Rendall, John M.	Torquay
1854	109	Reynolds, Richard	Leeds
1842		Reynolds, William	Halesworth
1849		*Rhodes, Frank	Spalding
1853		Rhodes, James	Manchester
1853		Rich, Thomas	Weston-super-Mare
1853		*Richards, William	Falmouth
1853		Richardson, Allen	Manchester
1859	459	*Richardson, John George Frederick	Leicester
1842		Richmond, Robert	Leighton Buzzard
1842		Rimmington, Felix U.	Bradford
1842		Ritson, John George	Sunderland
1842		Ritson, Thomas	Sunderland
1841		Roberts, Albinus	St. Albans
1842		Roberts, Charles	Westbury
1852		Roberts, Griffith J.	Holyhead
1858	483	*Roberts, Peter	Denbigh
1853		Roberts, Thomas A.	Conway
1852		Robertson, James	Edinburgh
1853	331	*Robertson, Thomas B.	Cullen
1855	193	Robinson, Benjamin	Pendleton
1842		Robinson, James Mowld	Beverley
1854		Robinson, Levi	Alford
1855	249	Robinson, Ralph	Lynn
1842		Robson, George	Durham
1851		Robson, Thomas	Brighton

Year of Member-ship.	No. of Certificate.	NAME.	RESIDENCE.
1853		Rodgerson, William	Liverpool
1847		Roe, Septimus	Salisbury
1842		Rogers, John	Ledbury
1853	5	Rogers, John Robinson	Honiton
1853		Rogers, William	Maidstone
1842		Rogerson, Michael	Bradford
1853		Rome, Robert M.	Langholm
1853		Rook, Edward	Sittingbourne
1853		Rooker, Abel	Chepstow
1853		Row, Charles	Devonport
1843		Rowe, John	Plymouth
1853		Rowland, Thomas	Epping
1853		Rowland, William S.	Devizes
1853	84	*Russell, Charles J. L.	Windsor
1846		Russell, Thomas	South Shields
1853		Rust, James	Thaxted
1853		Rutherford, Thomas H.	Seaham Harbour
1853		Sagar, Henry	Leeds
1841		Salisbury, John	Sheffield
1858	219	Salisbury, William Bryan	Leicester.
1842		Sanders, Henry Wotton	Bristol
1847		Sandiland, Robert B.	Bicester
1853		Sangster, John	Aberdeen
1853		Satterley, William B.	Guernsey
1845		Saunders, David Price	Haverfordwest
1853		Saunders, George J.	Oswestry
1841		Savage, William Dawson	Brighton
1863	616	*Savage, William Wallace	Brighton
1841		Sawer, William	Nayland
1841		Sawyer, Thomas	Ramsgate
1842		Sawyer, James	Carlisle
1853		Saxby, Henry	Lewes
1852		Scarrow, William	Sunderland
1846	2	Schacht, Frederick George	Clifton
1853		Scott, Edward	Birmingham
1857	317	Scott, George	Bury St. Edmunds
1854	239	Seath, Alexander	Dunfermline
1849		Seaton, George	Chelmsford
1847		Seaton, John Love	Hull
1841		Selfe, Isaac	Bristol.
1843		Severs, Joseph	Kendal
1846		Sewell, James C.	Sheffield
1853		Sewell, John Holmes	Swindon
1841		Seyde, John F.	Willenhall
1841		Shackel, John Webb	Maidenhead
1853		Shadford, Major	Spalding
1853		Sharland, Edmund T.	Bristol
1853		Sharp, Benjamin	Liverpool
1847		Sharp, Henry	Christchurch
1843		Sharples, George	Preston
1853		Shattock, John	Taunton
1842		Shaw, Alexander Henry	Stockport
1848		Shaw, John	Liverpool
1854		Shenstone, James B.	Colchester

Year of Membership.	No. of Certificate.	NAME.	RESIDENCE.
1853		Shepherd, James	Aberdeen
1857	371	Shepherd, George Prentis	Guildford
1848		Shepperley, James	Nottingham
1852		Shield, George	Arbroath
1853		Shield, Spooner	Liverpool
1842		Shillcock, Joseph Bradley	Bromley, Kent
1853		Sidebottom, William	New Mills
1842		Silvester, Joseph	Knutsford
1853		Sim, James	Aberdeen
1842		Simonds, William	Boston
1843		Simpson, John	Hull
1842		Simpson, Thomas	Stowmarket
1853		Sinclair, William	Aberdeen
1852		Sircom, Richard	Bristol
1841		Sirett, George	Buckingham
1863	277	Sirett, George B.	Buckingham
1853		Slayter, George	Reading
1853		Smale, Richard Bill	Oswestry
1843		Smallwood, John Wright	Macclesfield
1853		Smart, Nevill	Littlehampton
1841		*Smeeton, Edward	Leeds
1862	441	*Smeeton, George Henry	Leeds
1859	454	*Smeeton, William	Ironbridge
1853		Smethurst, Richard L.	Salford
1842		Smith, Alfred	Tenterden
1853		Smith, Henry	Eccleshall
1842		Smith, Henry	Edinburgh
1842		Smith, James Russell	Woodbridge
1853		Smith, James S. T. W.	Hexham
1860	603	*Smith, James Taylor	Kilmarnock
1853		Smith, John	Aberdeen
1843	31	Smith, John	Southampton
1841		Smith, Nathaniel	Cheltenham
1841		Smith, Thomas	Colchester
1853		*Smith, Thomas	Edinburgh
1856	416	*Smith, Thomas J.	Hull
1842		Smith, William	North Shields
1849		Smith, William	St. Andrews
1842		Smith, William	Sutton Coldfield
1842		Smith, William	Woolwich
1842		*Smith, William	Abingdon
1853		Smith, William	Bridlington
1853	169	Smith, William	Brighton
1853		Smyth, Walter	Merthyr Tydfil
1842		Snape, Edward	Birmingham
1841		Snowdon, George Wrangham	Wimbledon
1841		Southall, William	Birmingham
1850		Southall, William, jun.	Birmingham
1842		Sowerby, John	Carlisle
1843		Spencer, Charles	Gravesend
1853		Spencer, George	Lincoln
1853		Spencer, Thomas	Wokingham
1853		Spencer, William Henry	Burnham Market
1842		Spicer, Thomas	East Moulsey

Year of Membership.	No. of Certificate.	NAME.	RESIDENCE.
1853		Spokes, Peter	Reading
1845		Spong, Thomas Willsden	Biggleswade
1842		Squire, William	Hanwell
1853		Squire, William	Nottingham
1853		Squire, William	Goole
1853		Stafford, William	Gloucester
1842		Standring, Thomas	Manchester
1860	480	*Stanford, Edward C. Cortis	Worthing
1842		Stantial, John	Corsham
1855	148	Steel, David	Edinburgh
1856	291	Steel, Henry	Shefford
1853		Steel, Samuel	Beccles
1853		Stephens, Thomas	Merthyr Tydfil
1858	492	*Stephenson, John B.	Edinburgh
1853		Sterriker, John	Driffield
1852		Stevens, George	Strood
1849		Stevens, John	Birmingham
1846		Stevenson, Richard	Derby
1854	278	Steward, Alfred	Yarmouth
1842		Steward, Charles S. Dale	Yarmouth
1853		Steward, John	Brierley Hill
1841		Steward, Josiah	Kidderminster
1841		Steward, Theophilus	Kidderminster
1847		Steward, William	Bridgenorth
1858		Stewardson, Henry	Bedford
1841		Stiell, Gavin	Dunfermline
1858	491	*Stirling, George	Dunoon
1853		Stoddart, William Walter	Bristol
1853		Stone, John	Exeter
1852		Stonham, Thomas G.	Maidstone
1841		Stott, William	Sowerby Bridge
1853		Strange, William Bond	Bristol
1847		Strawson, Henry	Crewkerne
1862	550	*Street, Edward	Cheltenham
1856	292	Stroud, John	Bristol
1842		Stuart, Charles	Woolwich
1841		Sturton, John	Peterborough
1853		Sturton, Joseph	Cambridge
1855	394	*Sturton, Richard	Peterborough
1852		Sumner, John	Birmingham
1852		Sumner, Robert	Liverpool
1856	170	Sumner, William	Birmingham
1853		Sutherland, John	Aberdeen
1853		Sutterby, Jonathan N.	Long Sutton
1860	573	*Sutton, Charles William	Stowmarket
1853		Sutton, Francis	Norwich
1853		Swindells, Frederick M.	Blackpool
1852	149	Tait, William	Edinburgh
1841		Tanner, Nicholas William	Exeter
1853		Taplin, Joseph	Bristol
1847		Tarzewell, Richard	Braintree
1841		Tatham, John Walkingame	Barnstaple
1852		Tatham, Leonard F.	Bradninch
1845		Tayler, William Henry	Warminster

Year of Membership.	No. of Certificate.	NAME.	RESIDENCE.
1842		Taylor, Edward	Rochdale
1842		Taylor, James	Manchester
1841		Taylor, John	Preston
1852		Taylor, John	Wakefield
1848		Taylor, John Usher	Bedford
1854	362	Taylor, Richard	Ryde
1850		Taylor, Sydney	Pendleton
1842		Taylor, Thomas H.	Manchester
1841		Taylor, William James	Middlesborough
1848	7	Teasdale, Thomas B.	Darlington
1842		Teear, John Manshaw	Leicester
1853		Templeton, John	Perth
1853		Thomas, James	Bridge, Kent
1853		Thomas, James	Hythe
1853		Thomas, John	Cowbridge
1842		Thomas, John Holliday	Boston
1846		Thomas, Richard	Burnley
1852		Thomas, Robert	East Looe
1846		Thompson, Andrew	Carlisle
1862	559	*Thompson, Charles Henry	Maidenhead
1846		Thompson, Edward	Otley
1853		Thompson, George	Alston
1842		Thompson, Henry	Middlesborough
1853		Thompson, Henry	Norwich
1849		Thompson, John	Liverpool
1841		Thompson, John	Thirsk
1859	502	Thompson, John Robert	Bishopwearmouth
1850		Thompson, Thomas	Richmond, Yorkshire
1853		Thompson, William	Sunderland
1853		Thonger, Gilbert	Birmingham
1853		Thorne, John	Wellingborough
1853		Thornton, Edward	Lyme Regis
1853		Thornton, John	Wedmore
1857	417	Thornton, John Barber	Dover
1842		Thornton, Samuel	Exmouth
1853		Thurland, Edward	Oxford
1853		Tiernan, Robert	Liverpool
1853		Timothy, Thomas Norris	Reading
1841		Titherington, Thomas A.	Liverpool
1863	532	Tollinton, Richard B.	York
1843		Tomlinson, Charles Knowles	Lincoln
1847		Tonge, James Seawin	York
1853		Toone, Joseph Vidler	Warminster
1853		Townsend, John H.	Bristol
1842		Tozer, Richard John	Exeter
1841		Tribe, John	Chatham
1841		*Trix, John	Exeter
1841		Trueman, William	Durham
1841		Tryon, William George	Portsea
1857	342	*Tuck, Francis	Oxford
1842		Tuck, William Henry	Gosport
1843		Tucker, Charles	Bridport
1853		Tucker, James	Gloucester
1853		Tuff, John	Enfield

Year of Membership.	No. of Certificate.	NAME.	RESIDENCE.
1842		Tunley, John	West Bromwich
1851		Turner, Frederick E.	Holywell
1848		Turner, John A.	Liverpool
1853		Turner, Robert	Oundle
1856	264	Turner, Walter	Mold
1854	265	Turner, William Henry	Oswestry
1853	162	Turney, Samuel B.	Plymouth
1853		Turton, Luke	Bradford
1853		Turton, Thomas J.	Howden
1859	516	*Twinberrow, John	Worcester
1841		Tylee, John P.	Bath
1842		Uppleby, Henry	Leamington
1862	594	*Underdown, Frederick William	Farnham
1853		Urquhart, James	Aberdeen
1853		Veitch, James	Dunse
1853		Veitch, William	Shildon
1845		Vincent, Philip	Fulham
1853		Vose, Thomas	Liverpool
1842		Wain, William	Ripley
1842		Wainwright, James	York
1842		Waite, Joseph	Cheltenham
1847		Walker, Edward	Newcastle-on-Tyne
1842		Walker, Edward Hawxby	Doncaster
1841		Walker, George Clarke	Jersey
1853		Walker, John	Bradford
1842		Walker, William	Malmesbury
1846		Walker, William Henry	Southport
1842		Walkinton, William	Tenby
1848		Wall, William James	Tottenham
1857	75	Wallworth, David	Maldon
1860	266	Walmsley, Samuel	Kingston-on-Thames
1854	343	Walsh, Edward	Manchester
1861	595	*Walsh, Edward	Oxford
1853		Walter, Joseph	Horncastle
1848		Walton, John	Sunderland
1842		Warburton, Thomas	Chowbent
1841		Ward, James	Falkingham
1851		Ward, William	Sheffield
1853		Wardle, William Henry	Stalybridge
1842		Warrior, William	Northallerton
1853		Waterall, George	Nottingham
1853		Waterall, George Edwards	Nottingham
1853		Waterfall, William	Newcastle-on-Tyne
1842		Watkins, George H.	Walsall
1853		Watkinson, Thomas	Cinderford
1859	517	*Watson, David	Kettering
1847		Watson, Edward M.	Worle
1846		Watson, Henry	Cambridge
1862	660	*Watson, James	Newcastle-on-Tyne
1853		Watt, James	Haddington
1856	110	Watts, Henry Thomas	Manchester
1861	602	Watton, Edward	Worcester
1853		Wavell, John	Ryde
1853		Wearing, William	Lancaster

Year of Membership.	No. of Certificate.	NAME.	RESIDENCE.
1853		Wearing, William Henry	Liskeard
1842		Weaver, Frederick	Wolverhampton
1853		Webster, Edwin P.	Newcastle-on-Tyne
1852		Webster, Samuel M.	Warrington
1853		Welch, Charles	Nottingham
1844		Weller, George	Windsor
1850		Wellington, Frederick G. N.	South Petherton
1842		Wellington, James Martin	Oakham
1853		Wellman, William Richard	Jersey
1862	607	Wells, Edwin	Ludlow
1852		Welsh, Alexander	Dalkeith
1853		West, Henry James	Coventry
1856		West, William	Henfield
1853		Westmacott, George	Manchester
1854	180	Wharrie, Decimus	Liverpool
1854	156	*Wheeler, Francis	Norwich
1846		Wheeler, James Edward	Ryde
1847		Wheeler, John	Chipping Sodbury
1842		Whimpray, John	Lancaster
1853		Whitall, James	Chertsey
1853		White, Frank	Nottingham
1842		White, Robert Rowles	Dursley
1842		White, Thomas	Bilston
1853		Whitehead, John	Rochdale
1863	676	*Whitfield, John	Scarborough
1847	16	Whitfield, John	Worcester
1842		Whitfield, John Lockley	Worcester
1846		Whitlock, Edwin	Salisbury
1852		Whittaker, Ellis	Salford
1853		Whittaker, William	Runcorn
1853		Whittle, Samuel	Leigh
1852		Whitwell, John	Thirsk
1853		Wibmer, Lewis Michael	Tunbridge
1853		Wice, Jonathan Haigh	Wakefield
1849		Wickham, William	Deptford
1842		Wigg, John Goddard	Lynn
1845		Wiggin, John	Ipswich
1853		Wild, David	Oldham
1853		Wild, Joseph	Hyde
1847		Wilde, Eli	Manchester
1858		Wilkes, David	Bredon
1850		Wilkes, Doctor Tyers	Upton-on-Severn
1852		Wilkes, Seth Martin	Tewkesbury
1842		Wilkes, William	Bromyard
1850	73	Wilkinson, William	Manchester
1853		Williams, Edwin	Manchester
1857	474	*Williams, Henry Levi	Newport, Monmouth
1854		Williams, Joel D.	Bodmin
1853		Williams, John	Leamington
1853		Williams, Philip	Horsham
1853		Williams, Robert	Liverpool
1859	531	*Williams, Thomas Kemble	Welchpool
1844		Williams, Walter	Hereford
1853		Williams, William	Haverfordwe

Year of Membership.	No. of Certificate.	NAME.	RESIDENCE.
1844		Williamson, James	Hunslet
1855	171	Wills, Thomas D.	Barnstaple
1853		Wilshaw, James	Wordsley
1853		Wilson, Edward	Sheffield
1860	152	Wilson, James	Edinburgh
1853		Wilson, John	Harrogate
1855	303	Wilson, Joseph	Penrith
1842		Wilson, Thomas	Bradford
1854		Wilson, William	York
1841		Wine, John	Bristol
1842		Wing, Thomas N.	Melton Mowbray
1856	254	Wingate, Stephen	Gloucester
1842		Witherington, Thomas	Worcester
1853		Withey, William Henry	Stroud
1842		Wood, Edwin	Abersychan
1853		Wood, Benjamin	Halifax
1852	111	Wood, Edward	Brighton
1846		Wood, Henry	Brentford
1853		Wood, John Edward	Harlow
1842		Wood, William Webb	Pontypool
1853		Woodcock, Page D.	Lincoln
1852	360	*Woodcock, Joseph	Leicester
1842		Woods, William	Worcester
1842		Wooldridge, Thomas	Windsor
1844		Woolley, Daniel	Stockport
1858	521	*Woolley, George Stephen	Manchester
1854		Woolrich, Thomas	Stone
1850		Wootton, William	Wolverhampton
1856	255	Wortley, John	Durham
1842		Wreaks, George D.	Sheffield
1842		Wreaks, Thomas Peacock	Glossop
1842		Wright, Charles	Manchester
1846		Wright, George Warren	Macclesfield
1853		Wright, James	Chesterfield
1853		Wright, Joseph	Ardwick
1853		Wright, William	Liverpool
1853		Wyatt, Samuel	Tottenham
1845		Wylde, James	Manchester
1841		Wyley, John	Coventry
1852	153	Young, James R.	Edinburgh
1844		*Young, John	Sunderland
1853		Young, Tonkin	St. Ives
1853	224	Youngman, Edward	Bury St. Edmunds
1855	345	*Youngman, Robert	Cambridge

ASSOCIATES

ADMITTED BEFORE THE 1st OF JULY, 1842.

NAME.	RESIDENCE.
Baigent, William H.	London
Bannick, Henry Stokes	London
Barber, William Jas.	London
Brewster, Godfrey W.	Cambridge
Brown, Henry F.	London
Buss, Thomas	London
Chadwick, Henry	London
Charity, William	Alford
Dallas, John	London
Dunn, Edward	London
Hindsley, Henry	London
Lee, James	London
Mackey, John B.	London
Morgan, William B.	London
Ryder, William Henry	Birmingham
Sawyer, Henry	Ramsgate
Scholefield, Henry	London
Selleck, Edward	London
Steele, John W.	London
Sylvester, Paul	Birmingham
Townsend, Charles	London
Turner, George	Honiton
Walker, Henry	London
Walker, William	Malmesbury
Were, Ellis	London
Wood, John	London

ASSOCIATES OF THE SOCIETY

WHO HAVE PASSED THE MAJOR EXAMINATION.

Year of Admission.	No. of Certificate.	NAME.	RESIDENCE.
1849	76	Alexander, William	Peckham
1862	698	Allcock, Christopher	Nottingham
1857	665	Argles, Robert	Clapham
1858	510	Ashton, John	Belper
1859	562	Austin, Henry Felix	London
1862	677	Bailey, John Bassatt	Reading
1846	424	Barker, Matthew Mark	York
1854	551	Barnes, Edwin	Durham
1854	374	Barnsby, Robert David	Tours
1860	626	Bartlett, James	Bath
1860	608	Bass, James	London
1857	597	Bearcroft, Richard James	Cheltenham
1860	589	Bell, William Henry	Whitehaven
1859	644	Benger, Frederick Baden	Harlow
1853	576	Bennett, George	Blandford
1853	346	Bennett, Robert	Lincoln
1855	496	Berger, Volcy	Clapham
1852	208	Blackburn, Francis	Ramsgate
1857	577	Blackman, Thomas	Woolwich
1856	449	Bloye, Henry	Holt
1862	692	Bond, Purnell	Bristol
1859	699	Bourdas, John	London
1861	683	Bray, John	Crediton
1853	611	Briggs, James Aston	Tipton
1862	700	Broughton, Samuel R.	Wrexham
1861	674	Brown, Francis James	Weston-super-Mare
1861	630	Browne, Henry Robert	Deptford
1853	376	Chapple, Edwin	Bideford
1853	527	Chater, Edward Mitchell	Watford
1854	380	Christopher, James	Crickhowell
1859	648	Coles, John William	Camberwell
1860	599	Clayton, Henry	Lewisham
1853	281	Cleave, Charles T.	Chudleigh
1858	613	Colby, John	Brighton
1853	547	Cook, William	Grantham
1854	466	Cornelius, James	Clapham
1856	617	Cornish, William	Brighton
1853	395	Cracknell, Benjamin	Halesworth
1853	590	Cutting, Thomas John	Selby
1851	351	Daines, Thomas	London
1859	566	Delves, George	Tunbridge Wells
1861	640	Duffin, Thomas	Wakefield
1853	368	Evans, William H.	Haverfordwest

Year of Admission.	No. of Certificate.	NAME.	RESIDENCE.
1856	461	Featherstone, John P.	London
1859	649	Ferneley, John William	Grantham
1854	646	Fidel, Albert James	Oxford
1853	336	Fisher, William F.	London
1856	554	Fleetwood, Thomas	Stratford-on-Avon
1862	678	Flesher, Sanderson	Scarborough
1855	690	Fletcher, John	Camberwell
1860	657	Francis, Robert D.	Bishop's Castle
1858	511	Francis, Thomas Harper	Dulwich
1861	631	Garland, Alfred Philip	Hereford
1853	614	Gething, William B.	Lincoln
1858	569	Giddings, William H. C.	London
1858	525	Gray, Frederick	London
1855	548	Green, Conrad Samuel	Stratford-on-Avon
1860	591	Grieves, Austin Stirling	Ludlow
1854	529	Griffiths, Alfred William	London
1860	624	Grindley, William	Chester
1863	695	Grosvenor, Frederic	Hanley
1856	438	Groves, Henry	Weymouth
1856	584	Hall, Thomas Howard	Southampton
1860	684	Hardy, Samuel Croft	Birmingham
1859	571	Hickman, William	Manchester
1856	574	Hill, William	Edinburgh
1854	561	Hinton, Henry Archibald	London
1861	672	Hodder, Alfred	Bristol
1860	600	Hodges, William	Ramsgate
1859	673	Holgate, Walter	Liverpool
1861	633	Holloway, Thomas Henry	Sydenham
1853	353	Holroyde, William Henry	Bradford
1859	615	Hooper, Frank	London
1858	675	Hughes, Hugh Griffith	Holyhead
1861	634	Hughes, Roger	Chester
1861	653	James, John	Swaffham
1853	472	Johnson, Joseph	London
1861	686	Jones, John Edwards	Cardigan
1861	635	Jones, Walter William	Brecon
1856	489	Jones, Peter Cooke	London
1859	593	Jones, Robert William	Greenwich
1855	572	Keene, John	Brighton
1862	679	Kitchin, William Henry	Whitehaven
1859	629	Laurens, Frederic Lemprière	Jersey
1856	587	Lawrence, Henry	Stratford, Essex
1857	478	Lee, John William	Liverpool
1856	300	Linford, John	Canterbury
1853	330	M'Intyre, Peter S.	Warkworth
1856	451	Marks, Nelson S.	Cardiff
1852	680	Marrack, Philip	Crediton
1860	615	Meadows, Henry	Gloucester
1857	512	Mee, George	Woolwich
1861	654	Morgan, David	Aberayron
1853	216	Morgan, William	Richmond
1860	636	Morris, Henry	Liverpool
1858	659	Nesbit, John	Berwick

Year of Admission.	No. of Certificate.	NAME.	RESIDENCE.
1857	482	Oliver, John Hamer	Salop
1857	581	Orton, Thomas J.	Nuneaton
1856	520	Owles, Edward John	Southampton
1852	530	Paine, Standen	Brighton
1853	354	Parrott, John S.	Birmingham
1857	542	Pearson, George B.	Leeds
1860	666	Pearson, Henry Jackson	Louth
1847	425	Peel, James	Canterbury
1853	413	Penton, Charles W.	Maidstone
1858	582	Pertwee, Frederic	London
1859	565	Powers, Edward	Stourbridge
1853	422	Preston, Richard	London
1856	439	Reynolds, Arthur	Watton
1855	440	Richards, Charles	Weymouth
1858	544	Richardson, Robert	Ipswich
1853	545	Roberts, Albinus John	Horsham
1848	250	Rolfe, William A.	Wokingham
1862	668	Sampson, Robert George	London
1860	647	Sanders, Albert John	Sandgate
1853	463	Sarsfield, William	Durham
1854	638	Saxby, Henry	Lewes
1856	452	Scholefield, Arthur	Basingstoke
1853	316	Scott, Thomas	Birmingham
1853	188	Sidley, Thomas Insall	Edinburgh
1859	639	Simpson, Arthur Lankester	Stowmarket
1853	356	Smith, Joseph	Birmingham
1857	475	Smith, William	Glasgow
1853	349	Smith, Richard	Reigate
1855	651	Spearing, James	Southampton
1863	697	Stark, William Geddes	Dundas, Canada Wt.
1853	509	Steevens, Joseph G.	Guildford
1853	687	Stevens, Henry William	Colchester
1861	662	Strawson, George Frederick	Crewkerne
1855	656	Sturton, John Rowland	Peterborough
1847	33	Swann, William H.	London
1857	606	Symes, Charles	Thornbury
1855	409	Taplin, Frederick	Bristol
1857	691	Tayler, George Spratt	Harrogate
1860	575	Taylor, Herbert D.	Manchester
1853	221	Taylor, John N.	Lincoln
1853	320	Thompson, Henry	Leatherhead
1856	498	Tiplady, Frederick	York
1861	625	Towers, Robert	Ulverston
1860	705	Trollope, William Thomas	Yarmouth
1855	664	Tuck, John	Trowbridge
1856	427	Tyler, Henry Wing	Leicester
1861	688	Utley, Alfred	London
1855	560	Videon, Charles	London
1863	694	Wadsworth, Richard	Preston
1862	681	Ward, Joseph	Nuneaton
1853	253	Ward, Philip D.	Halifax
1860	663	Waites, Edward William	Ross
1861	669	Walkington, Thomas James	Tenby

Year of Admission.	No. of Certificate.	NAME.	RESIDENCE.
1856	596	Waugh, Alexander	Southampton
1860	682	Welborne, George	Grantham
1853	456	West, Robert G.	Liverpool
1856	455	Weston, Charles	Lincoln
1857	503	Wheldon, Henry William	London
1851	114	Whitfield, Henry	Worcester
1855	442	Williams, David Martin	Truro
1854	359	Willmott, William	Bristol
1856	670	Willsher, Stephen Henry	Tenterden
1863	696	Wink, John Adam	Edinburgh
1859	643	Young, William	Banbury

ASSOCIATES OF THE SOCIETY

WHO HAVE PASSED THE MINOR EXAMINATION.

Year of Admission.	No. of Certificate.	NAME.	RESIDENCE.
1853	704	Ambrosse, John D. L.	Putney
1853	441	Allingham, George Samuel	London
1856	424	Arnold, Spencer	Maidstone
1854	352	Attfield, John	London
1857	710	Baker, Thomas	Blandford
1861	722	Barlow, John	Birmingham
1861	711	Barnitt, John	Leeds
1862	758	Barton, Frederick George	Leicester
1850	393	Baxter, George	Chester
1862	767	Beal, Edmund John	Harlow
1856	437	Bell, William M.	Stonehouse
1857	712	Bell, James Alfred	Brighton
1857	691	Bell, William	Bedford
1862	772	Bisset, George M.	Edinburgh
1861	692	Blane, Gilbert	Mauritius
1863	784	Borchert, Theodor	Berlin
1859	587	Bothamley, Valentine	Newark
1856	745	Brayshay, Thomas	Stockton-on-Tees
1859	601	Brett, Robert	Bath
1856	681	Brew, John A.	Brighton
1860	626	Brooks, Frederick	Tunbridge Wells
1858	536	Brown, Charles Hills	Devonport
1856	765	Brown, George	Great Driffield
1855	461	Brown, John	London
1852	178	Buchanan, James	Edinburgh

Year of Admission.	No. of Certificate.	NAME.	RESIDENCE.
1856	766	Burt, James	Harrogate
1852	179	Cameron, William	Edinburgh
1858	729	Capern, Alfred	Bedford
1860	670	Capner, William M.	Birmingham
1860	783	Carteighe, Michael	London
1862	760	Chave, Francis William	Uxbridge
1853	636	Christian, John O.	Douglas
1860	660	Churchyard, Robert L.	Bungay
1859	582	Clapham, Edward	Leeds
1860	655	Cleave, Samuel W.	Bodmin
1854	344	Clingan, William M.	Edinburgh
1853	543	Cocking, Thomas	Maldon
1848	226	Coles, Ferdinand	London
1859	762	Conder, George	Walworth
1861	724	Dale, George William	Chichester
1856	531	Dallas, Clement	Woodbridge
1857	443	Dakin, John	Chester
1858	748	Davenport, John Metcalf	London
1862	756	Davis, Frank Pratt	Newbury
1855	487	Davis, Richard	Walworth
1853	621	Dickins, Benjamin	Stratford-on-Avon
1847	779	Downes, Robert	Stockport
1853	761	Earland, William	Hay
1856	755	Eminson, John M. O.	Gainsborough
1859	627	Evans, John James	London
1856	418	Farr, Archer	Lambeth
1863	787	Fleeming, William	Wolverhampton
1857	492	Fowler, Charles Henry	London
1856	698	Fox, Edward M.	Falmouth
1861	694	Fuller, Ira Thomas	Beccles
1858	773	Fuller, Thomas Gilbert	Burntisland
1853	511	Gill, Levi John	Bridport
1855	405	Goddard, George	Lowestoft
1857	495	Goldfinch, George	London
1862	753	Gowland, William	Sunderland
1856	512	Green, James	Bath
1861	794	Griffith, William Henry	Bristol
1856	455	Grimwood, William	Ipswich
1857	569	Haines, John Jenkins	Bromsgrove
1855	404	Harden, Charles	Bristol
1857	471	Harrow, Henry	Tunbridge Wells
1852	600	Harvey, Sidney	London
1857	493	Hawkes, James	Birmingham
1862	754	Heathorn, Alfred	Reading
1859	786	Hickman, William	Maidstone
1863	785	Hicks, James Sellick	East Looe
1857	658	Hill, Francis	Leeds
1860	648	Hodgkinson, Charles	Leicester
1859	649	Holmes, Edward M.	Chelsea
1857	597	Holmes, William C.	London
1858	730	Hopgood, Richard Cooper	Chipping Norton
1860	731	Hoskin, Montague John Roberts	Southampton
1858	539	Hughes, Joshua	Crickhowell

Year of Admission.	No. of Certificate.	NAME.	RESIDENCE.
1857	496	Hunneman, Charles Julius	Hanover
1847	56	Huskisson, William J.	London
1858	532	Ingall, Joseph	Wath-upon-Dearne
1860	629	Ismay, John George V.	Bristol
1856	666	Jackson, Warwick	Colchester
1852	184	Jamie, Robert	Edinburgh
1854	479	Jefferson, Thomas	Cambridge
1855	380	Jolley, Horace	London
1863	788	Jones, Henry	Llanfachraith
1853	338	Keeling, Thomas G.	Howden
1861	763	Kerfoot, Thomas	Hyde
1859	589	King, James	Bristol
1853	544	Laming, Welberry	Market Rasen
1854	345	Leighton, Thomas	Edinburgh
1859	708	Lescher, Frank H.	London
1855	399	Lloyd, David L.	Carnarvon
1861	701	Long, Frank	Brighton
1859	795	Lucas, John Philip	Guildford
1848	265	Luff, Henry Thomas	Poplar
1860	638	Marriott, Frederick T.	Rugby
1860	618	Marten, Henry Oake	Newfoundland
1856	734	Martin, James	Southampton
1847	148	Matthews, William	London
1861	726	Maxwell, George Neal	Biggleswade
1858	533	Medwin, Aaron George	Greenwich
1859	631	Merrick, Charles James	Manchester
1859	790	Miller, Thomas Henry	Crediton
1856	591	Monger, Hamilton Stacey	Stroud
1858	545	Moore, Francis Samuel	Bristol
1858	506	Muskett, Edwin Burrell	Holt
1863	789	Neve, Francis Charles	London
1855	391	Nooten, Ernest Van	Edinburgh
1851	450	Nosworthy, Robert	Exeter
1860	643	Oliver, John Gerry	Holsworthy
1859	579	Paris, Thomas	Salisbury
1858	623	Partridge, William	Dudley
1859	780	Pasmore, Frederic Rich.	Chelsea
1859	749	Payne, Sydney	Stratford-on-Avon
1856	452	Pearson, Edward Smith	Liverpool
1863	781	Peele, Henry Anthony	Durham
1859	791	Phillips, Jonathan	Godalming
1855	611	Potts, Robert Alfred	London
1860	750	Preston, Joseph Classon	London
1857	713	Pritchard, George F.	Knightsbridge
1862	792	Pritchard, Urban	London
1858	540	Rawling, John Wray	Wisbeach
1856	524	Rees, Thomas George	Pembroke Dock
1856	613	Reynolds, Freshfield	Guildford
1853	294	Rhind, William W.	Berwick
1859	703	Richardson, Robert	Dumfries
1859	659	Ridding, William	London
1856	430	Roberts, Owen	Pwllheli
1857	460	Robinson, John	Woolwich

Year of Admission.	No. of Certificate.	NAME.	RESIDENCE.
1853	514	Robinson, William P.	Liverpool
1860	751	Rose, Alfred	London
1855	388	Routledge, Henry	London
1862	770	Saer, David Prothero	Pembroke Dock
1857	481	Scott, Joseph Robinson	Sheffield
1859	793	Scruby, William Yull	Romford
1857	508	Seymour, George	Oldbury
1858	578	Simpson, Henry David	Louth
1853	297	Simpson, Robert	Edinburgh
1853	321	Simpson, Thomas	Walsall
1860	644	Sims, Francis M. B.	Colchester
1858	509	Slack, John Lawrence	Ormskirk
1856	735	Slator, Thomas	Boston
1853	268	Speechly, George	Peterborough
1856	423	Stewart, James	Kirkcaldy
1853	281	Stoneham, Philip	London
1862	743	Swenden, James	Darlington
1855	383	Taplin, George	Bath
1849	326	Tasker, William	London
1854	346	Thomson, John	Edinburgh
1857	473	Tieftrunk, Julius	London
1858	744	Tilden, Wm. Augustus	London
1853	333	Todd, Thomas	Edinburgh
1858	736	Tolbort, Thomas W. H.	Dorchester
1851	144	Towl, Edward	London
1858	757	Umney, Charles	Bedford
1849	125	Warner, John	London
1860	625	Watson, Frederick	Fakenham
1860	796	Watts, John	London
1857	696	Watts, John Newton	London
1858	553	Weller, James William	Bloxwich
1858	529	Western, Samuel John	Leicester
1857	500	Wigg, Henry John	Lynn
1862	764	Wilson, Thomas	Stowmarket
1861	719	Wilson, Walter Wm.	Birmingham
1860	771	Wilson, William	Slough
1858	566	Wilkinson, George	Manchester
1856	432	Williams, Thomas	Carmarthen
1849	94	Willmott, Edwin	London
1860	715	Wills, Douglas	Lewisham
1858	541	Wilson, Charles Wallace	London
1861	709	Winterbottom, James	Oldham
1862	782	Wyman, John Sanderson	Alcester
1853	572	Young, John	Musselburgh
1860	634	Young, Robert Fisher	Gringley-on-the-Hill

REGISTERED APPRENTICES.

Date of Registration.	NAME.	RESIDING WITH	TOWN.
1857	Alderson, Frederick H.	Mr. Hempsted	St. Leonards
1862	Aldham, Charles James	Mr. Seaton	Chelmsford
1859	Allanson, George	Mr. Allanson	Harrogate
1860	Allen, E. Ransome	Messrs. Chapman, Bros.	Ipswich
1860	Allen, Samuel Stafford	Mr. Beale	Hemel Hempstead
1857	Allison, Richard R.	Mr. Howorth	Doncaster
1858	Allott, Frederick	Mr. Greaves	Bakewell
1859	Amoore, Alfred Stares.	Messrs. Randall & Sons	Southampton
1864	Anderson, John Brown	Mr. Rogerson	Bradford
1855	Andrews, Enos	Mr. Cropper	Long Sutton
1863	Andrews, George H.	Mr. Smith	Walworth
1860	Aplin, Benj. D'Oyley	Mr. Hill	Norwood
1862	Applegate, Sidney	Mr. Applegate	Upper Holloway
1857	Appleton, Robert	Mr. Wilson	Sheffield
1856	Atkinson, Edward F.	Mr. Kirton	Hull
1853	Atkinson, George John	Mr. Wilson	Harrogate
1858	Atkinson, John P.	Messrs. Hurst & Morton.	Louth
1858	Atwood, John Charles	Mr. Cracknell	London
1862	Autton, John Rydon	Mr. Hall	London
1858	Backhouse, Noah	Mr. Rowntree	London
1858	Badcock, Henry	Mr. Peat	Lymington
1857	Bagshaw, James	Mr. Handley	Wakefield
1859	Bamber, John K.	Messrs. Savory & Moore	London
1862	Barber, Harry	Ward and Co.	Richmond, Yorks.
1853	Barber, Tom	Mr. King	Rochester
1854	Barber, William	Mr. Nunn	Bury St. Edmunds
1864	Bardsley, William	Mr. Nicholson	Highbury
1857	Barlow, John Podmore	Mr. Barlow	Manchester
1861	Barnett, Elijah Wm.	Mr. Wood	Worcester
1860	Barnett, Thos. James	Mr. Golding	London
1861	Barrett, James	Mr. Merryweather	Leicester
1863	Barry, Henry	Messrs. Ritson & Sons	Sunderland
1851	Bartlett, Ebenezer	Mr. Mather	Reading
1856	Barton, Frederick	Mr. Wilson	Bradford
1863	Basker, John Perkin	Mr. Heald	Sleaford
1862	Bass, Charles William	Mr. Lovett	Gloucester
1854	Batchelor, George H. W.	Mr. Watts	Chatham
1856	Bate, Henry	Mr. Davies	Chester
1861	Bateman, Thomas H.	Mr. Tabor	Salisbury
1860	Battman, Thomas	Mr. Wright	Manchester
1855	Beach, Tom Clarke	Messrs. Lea & Co.	Great Malvern
1854	Beach, Wesley	Mr. Beach	Bridport
1860	Beale, Chas. George	Mr. Atkins	Salisbury
1860	Beale, Fred. Wilson	Mr. Atkins	Salisbury
1855	Beaton, Walter	Mr. Beaton	London
1861	Beattie, James	Mr. Gordelier	Sittingbourne
1860	Beattie, John	Mr. Mackay	Edinburgh
1859	Beavan, Alfred James	Mr. Matthews	London

Date of Registration.	NAME.	RESIDING WITH	TOWN.
1853	Beddard, John	Mr. Cross	Shrewsbury
1859	Bedford, Joseph	Mr. Bolton	Dover
1862	Beilby, Michael	Messrs. Goode & Son	Congleton
1861	Bell, Rich. Edward	Mr. Noakes	Brighton
1855	Bennington, William	Mr. Mortimer	Sidmouth
1859	Benson, James Levett	Mr. Dalwood	Sherborne
1855	Bentley, William J.	Mr. Pryer	Axminster
1859	Berrell, Charles	Mr. Farmer	London
1854	Bingley, Frederick B.	Mr. Tanner	Exeter
1863	Bingley, Richard	Mr. Tanner	Exeter
1861	Bird, Chas. John	Mr. Bird	Worcester
1854	Bird, David L.	Mr. Wilson	Canterbury
1854	Bishop, William	Mr. Gay	Stroud
1862	Bishop, Wm. M.	Mr. Bird	Worcester
1859	Blackbourne, Henry J.	Mr. Jeffery	Horncastle
1858	Bland, Percy Owen	Mr. Fox	London
1845	Blaxall, Arthur S.	Mr. Blanchflower	Loddon
1858	Blundell, Joseph A.	Mr. Groves	Weymouth
1850	Blyth, Wm. James	Mr. Hurworth	York
1859	Bolton, Edgar Benj.	Mr. Fairbank	Woolwich
1861	Bolton, Frederick Wm.	Mr. Claremont	London
1860	Bonnett, Frederick	Mr. Price	Bridgend
1860	Bowen, John Thomas	Mr. Parker	Bath
1856	Bowler, Harvey F.	Mr. Hitchcock	Colchester
1860	Boyd, John	Mr. Cornish	Brighton
1854	Bradley, Edwin S.	Mr. Parker	Derby
1858	Bradley, John Perry	Mr. Parker	Birmingham
1857	Brereton, Matthew B.	Mr. Mabson	Yarmouth
1858	Bridges, Charles Wm.	Mr. Biscoe	London
1862	Brinsmead, Thomas J.	Mr. Fowler	Torrington
1856	Brock, George Walter	Mr. Fairbank	Woolwich
1856	Brooks, Samuel Brewer	Mr. Lawton	Wakefield
1864	Brooks, Thomas	Mr. Swift	Spalding
1862	Brough, Henry James	Mr. Boyce	Windsor
1857	Brown, Edward	Mr. Dutton	Birkenhead
1860	Brown, James	Messrs. Gardner and Ainslie	Edinburgh
1860	Browne, James	Mr. West	Coventry
1862	Brownen, George	Mr. Sharp	Christchurch
1862	Bucklee, Marmaduke W.	Mr. Bucklee	London
1861	Bulgin, William	Mr. Groves	Blandford
1860	Bullock, Frederick	Mr. Parkes	Manchester
1863	Burbidge, Edwin	Mr. Maitland	London
1853	Burdock, James	Mr. Reading	Warwick
1860	Burlingham, Frederick	Mr. Johnson	Birmingham
1856	Burton, John	Mr. Parker	Derby
1854	Burton, Joseph	Mr. Wick	Sheffield
1858	Butler, Edward D. B.	Mr. Penney	Poole
1859	Butler, Edwin	Mr. Dowman	Southampton
1857	Campbell, Rubert	Mr. Mackay	Galashiels
1859	Canning, Charles W.	Mr. Keene	Leamington
1861	Cantrell, William S.	Mr. Tylee	Bath
1860	Carr, John	Mr. Scarrow	Sunderland
1861	Carré, Joseph	Mr. Tylee	Bath

Date of Registration.	NAME.	RESIDING WITH	TOWN.
1857	Carré, Louis C. A.	Mr. Tylee	Bath
1855	Carrington, Ebenezer T.	Mr. Toone	Warminster
1859	Carter, Thomas	Mr. Dresser	York
1855	Cartner, David	Mr. Bell	Carlisle
1863	Cave, Alfred	Messrs. T. & E. Anderson	London
1854	Chambers, William	Mr. Dresser	York
1855	Chapman, Francis C.	Mr. Green	Droitwich
1862	Cherrington, Arthur O.	Mr. Thomas	Boston
1862	Clampitt, Richard V.	Mr. Tanner	Exeter
1855	Clarke, Willoughby	Mr. Brown	Oxford
1858	Clarkson, Sidney	Mr. Macarthy	Romford
1860	Clayton, F. C.	Messrs. Harvey & Reynolds	Leeds
1857	Cole, Alfred	Mr. Groves	Hammersmith
1864	Cole, George	Messrs. Ereaut & Son	Jersey
1862	Collier, Thomas	M. Collier	Sheffield
1858	Collier, William	Mr. Collier	Sheffield
1864	Cooke, Charles Fletcher	Mr. Jones	Hanley
1861	Cooke, Francis	Mr. Kershaw	Southport
1860	Cooper, Arthur Cecil	Mr. Blandford	London
1855	Cooper, Frederick	Mr. Cooper	Leicester
1859	Cooper, Henry	Mr. White	Nottingham
1861	Copland, Herbert	Mr. Anthony	Bedford
1853	Cornish, Thomas Robert	Mr. Cornish	Penzance
1854	Coulson, Henry	Mr. Coulson	Scarborough
1855	Coulthard, Christopher	Mr. Harrison	Carlisle
1862	Court, Alfred	Mr. Reading	Warwick
1858	Coward, John Senior	Mr. Butler	Pontefract
1854	Cozens, William	Mr. May	Reading
1854	Crease, James R.	Mr. Mackay	Edinburgh
1853	Crussell, James W.	Mr. Cooper	London
1858	Curtis, Albert Augustus	Mr. Churchouse	Chard
1860	Dale, George	Mr. Hughes	Altrincham
1860	Dalrymple, David H.	Mr. Chapman	Bristol
1854	Dalrymple, William	Mr. Luff	Oxford
1863	Davies, David	Mr. Williams	Cardigan
1861	Davies, Francis P.	Messrs. Southall	Birmingham
1857	Davies, Robert John	Mr. Roberts	London
1858	Davies, William	Mr. Coleman	Cardiff
1856	Davison, William	Mr. Greaves	Bakewell
1858	Dawson, James Henry	Mr. Telfer	Oxford
1855	Dawson, John	Mr. Goddard	Yarmouth
1855	Dean, Samuel	Mr. Fox	London
1858	Denne, Henry	Mr. Kingdon	London
1861	Diaper, Albert	Mr. Banfield	Bury St. Edmunds
1858	Dodshon, Edward	Mr. Dodshon	Sunderland
1862	Doney, Francis Goss	Mr. Wagstaff	London
1862	Donkin, James Ewbank	Mr. Nicholson	Sunderland
1857	Doughty, Edward T.	Mr. Doughty	London
1860	Douglas, Archibald H.	Messrs. Argles & Co.	Maidstone
1856	Draper, Henry Foulger	Mr. Arnold	Norwich
1863	Duberly, George Smith	Mr. Owen	Highbury
1858	Dumolo, John Thomas	Mr. Parker	Birmingham
1863	Duncalfe, Richard		Wellington, Salop

Date of Registration.	NAME.	RESIDING WITH	TOWN.
1861	Dyson, Walter	Mr. Taylor	Pendleton
1859	Earnshaw, Benj. King	Messrs. Garratt	Rugby
1856	Eason, John	Mr. Gilkes	Leominster
1858	Eastman, Jabez	Mr. Clark	Hackney
1861	Edwards, Charles R.	Mr. Gunn	Harrow
1857	Edwards, Frederick H.	Mr. Medcalf	Lower Tooting
1854	Eland, Edward F.	Mr. Telfer	Oxford
1853	Elliot, Robert John	Mr. Steward	Yarmouth
1863	Ellis, Henry	Mr. Roberts	London
1859	Ellis, Henry Brook	Mr. Collins	Bristol
1862	Emerson, John	Mr. Emerson	Hartlepool
1864	Emsley, Joseph	Mr. Pratt	Bradford
1860	Epps, Franklin	Mr. Epps	London
1857	Evans, Alfred Paget	Mr. Cutting	Leamington
1853	Evans, Edward	Mr. Bancroft	Ruthin
1857	Eve, Charles	Mr. Wilson	Holloway
1864	Ewens, Frederick Thomas	Mr. Morris	Cheltenham
1854	Fairley, Robert	Mr. Mackay	Edinburgh
1860	Fancourt, John	Mr. Lavers	Blackheath
1856	Farrar, William	Mr. Heming	Sunderland
1862	Fenn, Charles Draper	Messrs. Ferris and Co.	Bristol
1863	Fever, William	Mr. Cuthbert	Bedford
1863	Finlay, James L.	Mr. Aitken	Edinburgh
1861	Finch, Thomas	Mr. Aitkin	Edinburgh
1861	Fitt, Fras. Ed.	Mr. Fitt	Barking
1845	Flood, William	Mr. Goodman	Exeter
1857	Foggitt, Thomas	Mr. Smeeton	Leeds
1862	Forbes, William T.	Mr. Forbes	Reigate
1853	Forth, William	Mr. Headley	Bridlington
1861	Fosbrooke, Fred. J. R.	Mr. Hickley	London
1854	Foster, Thomas U.	Mr. Weston	Sleaford
1863	Fox, William Robert	Mr. Fox	London
1862	Franklin, Alfred	Mr. Hunt	Winchester
1864	Garside, Thomas	Mr. Garside	Southport
1857	Gibbs, Thomas	Mr. Steward	Yarmouth
1851	Gilliatt, William	Mr. Gamble	Grantham
1864	Gillies, John Whitfield	Messrs. Retson & Sons	Sunderland
1859	Gillies, Wm. Jonathan	Mr. Dunn	St. Austell
1855	Goodchild, Nathaniel	Mr. Wood	Brighton
1863	Goodrham, Edward John	Mr. Crook	Farnham
1855	Goodwin, Charles S.	Mr. Chapman	Ipswich
1859	Goodwin, Medmer	Mr. Telfer	Oxford
1864	Gowan, Peter	Messrs. Duncan, Flockart, & Co.	Edinburgh
1860	Gray, Thomas	Mr. Banks	Birmingham
1861	Gray, William	Mr. Banks	Birmingham
1861	Greatrex, Thomas Jas.	Mr. Andrews	London
1860	Green, Edwin G.	Mr. Greaves	Bakewell
1862	Green, Isaac	Mr. Phillips	Coventry
1855	Gregory, Richard	Mr. Lavers	London
1858	Greig, Francis	Mr. Mackay	Edinburgh
1855	Grigor, William	Mr. Macfarlan	Edinburgh
1859	Hadley, Thomas	Mr. Harris	Hereford
1863	Hall, Alfred Richard	Mr. Lawrence	Kensington

Date of Registration.	NAME.	RESIDING WITH	TOWN.
1856	Halsey, Bennet	Mr. Husband	Exeter
1854	Ham, Charles	Mr. Foster	Collumpton
1860	Hamilton, Herbert B.	Mr. Savage	Brighton
1862	Hankin, Frederick	Mr. Horncastle	London
1860	Harland, Richard Thos.	Mr. Dresser	York
1854	Harley, Edward	Mr. Foster	Ludlow
1860	Harper, George	Mr. Deck	Cambridge
1858	Harper, Wm. James	Mr. Gent	Macclesfield
1860	Harris, Henry Wm.	Messrs. Ford and Miller	Reading
1861	Harrison, George	Mr. Harrison	Sheffield
1856	Harrison, Stephen	Mr. Breary	Douglas
1853	Haslam, Frederick B.	Mr. Dakin	Poplar
1856	Hatch, Richard M.	Mr. James	Bognor
1857	Hatchard, Stephen	Mr. Huggins	Alresford
1859	Hatchett, Thomas	Mr. Hemingway	London
1856	Head, John T.	Mr. Head	Lewes
1857	Heald, Alfred John	Mr. Barley	Wisbeach
1864	Heald, John Aulsebrook	Mr. Sinimberghi	Rome
1863	Hickman, Frederick	Mr. Dowman	Southampton
1857	Highway, Matthew H.	Mr. Caddick	Newcastle-u.-Lyne
1843	Hill, William	Mr. Rowe	Plymouth
1857	Hoare, James Raper	Mr. Gigner	Chelsea
1852	Hodgkinson, John S.	Mr. Brooker	Macclesfield
1861	Holden, Abraham Hobson	Mr. Handley	Wakefield
1856	Holland, William	Mr. Sibary	Longton
1859	Holmes, John Thomas	Mr. Botham	Manchester
1863	Holmes, Walter Murton	Mr. Mohun	Ramsgate
1855	Holmwood, William C.	Mr. Coppock	Bridport
1855	Holt, George F. W.	Mr. Obbinson	Sleaford
1856	Holt, William Henry	Mr. Poulden	Altrincham
1854	Horn, William	Mr. Longrigg	Appleby
1862	Howes, Thomas M.	Messrs. Greville & Taylor	Northampton
1859	Hudson, John William	Mr. Pratt	Bradford
1859	Hughes, Thomas Jones	Mr. Hughes	Holyhead
1854	Humphries, Henry A.	Mr. Grounds	Ludlow
1862	Hutchinson, Marshall H.	Messrs. Macfarlan	Edinburgh
1857	Iliffe, Frank	Mr. Brown	Coventry
1859	Isherwood, James	Mr. Greenwell	London
1858	Ive, William	Mr. Lawrence	Kensington
1863	Jackson, Charles Fred.	Mr. Collings	Bristol
1856	Jackson, John	Messrs. Wilson & Co.	Bradford
1861	Jackson, John E.	Messrs. Argles & Co.	Maidstone
1855	Jakins, George S.	Mr. Golding	London
1861	Jeffery, Henry	Mr. Sharland	Bristol
1860	Jelly, Stephen J.	Mr. Simpson	Hull
1862	Johnson, Eli	Mr. Harrison	Nottingham
1864	Jones, Cynric	Mr. Ellis	Abergele
1862	Jones, Frederick Wm.	Mr. Jones	London
1860	Jones, Hugh H.	Mr. Bancroft	Ruthin
1859	Jones, Jas. Davenport	Mr. Marston	Ludlow
1859	Jones, John Reed	Messrs. Garratt	Rugby
1861	Jones, Richard Edward	Mr. Jones	Carmarthen
1861	Jordan, Edmund H.	Mr. Chubb	London

Date of Registration	NAME.	RESIDING WITH	TOWN.
1860	Judson, Charles W.	Mr. Judson	Ripon
1861	Keen, John	Mr. Stocken	London
1856	Kemp, Francis	Mr. Smeeton	Leeds
1862	Kent, Thomas R.	Mr. Kent	London
1863	Kinch, Edward	Mr. Kinch	Henley-on-Thames
1860	King, James Hurman	Mr. Stroud	Bristol
1864	Kingerley, William S.	Messrs. Shadford & Co.	Spalding
1861	Kite, John C.	Mr. King	Rochester
1861	Knight, Benjamin	Mr. Maggs	Yeovil
1858	Knowles, John Hiles	Mr. Anthony	Bedford
1860	Lacey, Richard	Mr. Arnold	Norwich
1857	Lacey, Walter	Mr. Meredith	Bristol
1863	Lake, John Hinton	Mr. Tighe	Exeter
1855	Lamplough, John	Mr. Stevenson	Derby
1857	Langley, William	Mr. Tylee	Bath
1857	Lavers, Thomas F.	Mr. Lavers	Lewisham
1853	Lawrence, George	Mr. Wright	London
1858	Leppard, James	Mr. Williams	Horsham
1851	Lees, James	Mr. Clarke	Richmond
1860	Lightfoot, John	Mr. Shepheard	Chester
1860	Lindley, Wm. Walker	Mr. Evans	Swansea
1860	Livermore, George	Mr. Goodger	London
1862	Llewelyn, John	Mr. Lister	Cowbridge
1859	Llewellyn, Peter	Mr. Phillips	Carmarthen
1859	Lock, Edward	Mr. Haydon	Fordingbridge
1857	Lovatt, John Hammond	Mr. Wilshaw	Wordsley
1861	Ludgater, Alfred	Mr. Gordelier	Sittingbourne
1862	Luff, William	Mr. Luff	Oxford
1855	McCabe, Dunbar	Mr. Macfarlan	Edinburgh
1858	McGeorge, William	Mr. Carruthers	Dumfries
1857	Machon, Edward	Mr. Parkes	Manchester
1861	Mackmurdo, Edwd. L.	Mr. Mackmurdo	Edmonton
1860	Maine, Phillip B.	Mr. Wills	Barnstaple
1855	Malin, Edmund C. M.	Mr. Huggins	Barnet
1859	Manby, Thomas	Mr. Chenery	Ipswich
1847	Marrack, George	Mr. Searle	Crediton
1857	Martin, Benjamin	Mr. Handley	Wakefield
1859	Martin, Frederic	Mr. Chandler	Margate
1860	Martindale, William	Mr. Thompson	Carlisle
1857	Mason, John	Mr. Mason	Hastings
1857	Mathias, Thomas	Mr. Jones	Narberth
1862	Mathews, John H.	Mr. Bluett	Reading
1853	Matthews, Charles	Mr. Gostling	Diss
1860	Matthews, Frederick W.	Mr. Baker	Islington
1858	Maudson, Joseph W.	Mr. Maunder	Sheffield
1855	May, Augustus S.	Mr. Greenwell	London
1859	Metcalfe, Chas. J.	Mr. Maitland	London
1864	Metcalfe, Wilson	Mr. Davis	Harrogate
1858	Midgley, Charles	Mr. Rimmington	Bradford, York
1858	Midgley, J. E.	Messrs. Lynch & Wilkinson	Manchester
1857	Midgley, John James	Mr. Reinhardt	Hull
1856	Miller, Duncan S.	Mr. Pooley	Bath
1864	Mingay, George M.	Mr. Wigg	King's Lynn

Date of Registration.	NAME.	RESIDING WITH	TOWN.
1862	Mitchell, Robert Durno	Mr. Tabor	Salisbury
1863	Moir, Alexander	Messrs. Macfarlan	Edinburgh
1858	Monkhouse, Joshua	Mr. Davies	Gainsborough
1857	Moore, Abraham	Mr. White	Birmingham
1862	Moore, Geo. James	Mr. Stroud	Bristol
1856	Morley, Edward	Mr. Asling	Spalding
1856	Morley, George	Mr. Wheeler	Hackney
1860	Morris, William	Mr. Hardman	Kirkham
1859	Moysey, William	Mr. Moon	Ilfracombe
1853	Moverley, Robert	Mr. Dingley	Maidstone
1857	Murrell, John Friday	Mr. Maynard	Brandon
1862	Nelson, William	Mr. Atherton	Nottingham
1856	Newby, John	Mr. Hughes	Altrincham
1861	Newcombe, Henry A.	Mr. Baker	Lewisham
1862	Nix, John Beard	Mr. Nix	Billericay
1862	Oakes, George	Mr. Paulden	Altrincham
1861	Oldfield, Francis	Mr. Bolton	Dover
1859	Oliver, Robert Dawson	Mr. Smith	Southampton
1856	Overton, William	Mr. Fowke	Stafford
1852	Owles, James John	Mr. Owles	Yarmouth
1862	Padwick, John	Mr. Sharp	Christchurch
1864	Palmer, Alfred Neobard	Mr. Coleman	Bury St. Edmunds
1864	Palmer, Robert Frederick	Mr. Salisbury	Leicester
1863	Palmer, William Francis	Mr. Woodward	Nottingham
1862	Park, John	Mr. Pratt	Bradford, Yorks.
1863	Parker, Henry Walker	Mr. Binge	London
1860	Parkes, Robert	Mr. Townsend	Burton-upon-Trent
1863	Parrott, Edward John	Mr. Towle	Ardwick
1858	Pearcey, Herbert A.	Mr. Biggs	London
1859	Philpot, Arthur Walter	Mr. Wimble	Maidstone
1858	Pickup, Robt. Lansdale	Mr. Pickup	Manchester
1859	Picton, John T.	Messrs. Picton & Hatton	Warrington
1858	Pissey, William F.	Mr. Pissey	Rayleigh
1857	Pistrucci, Filippo	Mr. King	London
1855	Pitman, John	Mr. Fendick	Bristol
1862	Poore, James E.	Mr. Brew	Brighton
1859	Postans, Arthur Wm.	Mr. Banfield	Bury St. Edmunds
1854	Power, Thomas M.	Mr. Williams	Nottingham
1859	Pratt, Albert Edward	Mr. Smith	Bury St. Edmunds
1860	Pratt, Joseph	Mr. Loggin	Stratford-on-Avon
1857	Price, Thomas	Mr. Laen	Pembroke Dock
1861	Priestley, Henry	Mr. Priestley	Sheffield
1864	Prime, Thomas Robert	Mr. Cupiss	Diss
1860	Provost, John Arthur	Mr. Chaston	Lowestoft
1857	Prust, Richard	Mr. Brend	Swansea
1858	Pryce, Alfred C.	Messrs. Picton & Hatton	Warrington
1858	Pullen, William H.	Mr. Parkes	Atherstone
1853	Quinlan, Joseph	Mr. Times	London
1855	Rae, John Inglis	Mr. Mackay	Edinburgh
1858	Rainnie, Alexander	Mr. Stewart	Edinburgh
1856	Rastrick, Robert Joseph	Mr. Rastrick	Southsea
1863	Ray, William Herbert	Mr. Holman	Barnet
1858	Rayner, Gilmour G.	Mr. Brend	Swansea

Date of Registration.	NAME.	RESIDING WITH	TOWN.
1856	Rea, James Parker	Mr. Rea	London
1863	Redford, Edward A.	Mr. Nicol	Edinburgh
1857	Reed, Alfred	Mr. Gordelier	Sittingbourne
1863	Rees, Howell	Mr. Howell	Camden Town
1863	Rees, Joseph	Mr. Williams	Cardigan
1862	Rhodes, Francis	Mr. Ogden	Manchester
1860	Richardson, Joseph H.	Messrs. Balkwill & Sons	Plymouth
1853	Rickards, J. Edwin	Mr. Grieves	Ludlow
1858	Ritchie, John Moffat	Mr. Medley	Derby
1852	Rivers, Henry	Mr. Hornsby	Odiham
1856	Roberts, John L.	Mr. Sibary	Longton
1859	Roberts, Charles	Mr. Handley	Wakefield
1860	Roberts, Thomas E.	Mr. Jones	Rhyl
1859	Robertson, A. G.	Messrs. Macfarlan & Co.	Edinburgh
1857	Robinson, James F.	Messrs. Picton & Hatton	Warrington
1859	Rochford, Percy	Mr. Burden	London
1862	Rogerson, Herbert G.	Mr. Rogerson	Bradford, Yorks.
1864	Rogerson, William J.	Mr. Rogerson	Bradford, ,,
1862	Rollinson, Thomas	Mr. Wilshaw	Pensnett
1858	Romans, Thomas	Mr. Cutting	Selby
1856	Rosselloty, John C.	Mr. Couch	Islington
1853	Salmon, Henry L.	Mr. Moore	Brighton
1862	Samuel, James Burck.	Mr. Herington	Leighton Buzzard
1863	Sartin, Samuel Robert	Mr. Anderson	London
1860	Saul, William Benjamin	Mr. Pring	Taunton
1860	Saul, William W.	Mr. Prior	Oxford
1859	Savage, George Henry	Mr. Savage	Brighton
1863	Sawdon, Frederick John	Mr. Coulson	Scarborough
1860	Saxby, Robert	Mr. Saxby	Lewes
1857	Scott, James Furness	Mr. Smith	Dunstable
1857	Seaton, Charles A.	Mr. Hill	Sherborne
1862	Self, William Gilbert	Mr. Allchin	Barnsbury Park
1864	Selkirk, James	Mr. Mackay	Edinburgh
1861	Severs, Joseph	Messrs. Harvey & Reynolds	Leeds
1859	Shadford, Thomas	Mr. Shadford	Spalding
1864	Sharpe, Leonard George	Mr. Sharpe	Notting Hill
1863	Shaw, Henry Woolhouse	Mr. Wellington	Oakham
1855	Shaw, Ward	Mr. Lofthouse	Hull
1860	Shephard, T. F.	Messrs. Schweitzer & Co.	Brighton
1854	Shepley, Samuel	Mr. Claughton	Chesterfield
1857	Sheriff, Thomas	Mr. Macfarlan	Edinburgh
1862	Simpson, James	Mr. Halliday	Manchester
1855	Simpson, Thomas	Mr. Allen	Boston
1845	Slater Henry	Mr. Asling	Spalding
1856	Smart, Benjamin	Messrs. Lea & Co.	Worcester
1862	Smith, Edward	Mr. Savage	Brighton
1853	Smith, Frank de Carle	Mr. Wright	London
1864	Smith, Walter Henry	Mr. Burden	London
1864	Smith, John	Mr. Halliday	Manchester
1854	Smith, Frederick	Mr. Foster	Ludlow
1859	Smith, George Henry	Mr. Tonge	York
1860	Smith, Herbert Geo.	Mr. Witherington	Worcester
1858	Smith, Hubert	Mr. Luff	Oxford

Date of Registration.	NAME.	RESIDING WITH	TOWN.
1854	Smith, James W.	Mr. Coulson	Scarborough
1860	Smith, Rawson	Mr. Davis	High Harrogate
1862	Smith, Robert Ayre	Mr. Hemming	Bishopwearmouth
1860	Smith, Thomas Hoskins	Mr. Rook	Sittingbourne
1859	Smyth, Samuel Walton	Mr. Sims	Barnsbury
1858	Soole, Seymour Henry	Mr. Jessopp	Bishop Stortford
1860	Sproat, Robert	Mr. Parker	Derby
1861	Spurling, William	Mr. Watts	Chatham
1860	Squire, Frank R.	Mr. Asling	Spalding
1862	Squire, Peter W.	Mr. Squire	London
1858	Stanley, Robert Swan	Mr. Wortley	Durham
1854	Stanway, William H.	Mr. Blandford	London
1857	Stapleton, Thos. Glode	Mr. Collins	London
1862	Starkey, Ebenezer Ben.	Mr. Humpage	London
1862	Stebbing, Walter	Mr. Forbes	Reigate
1863	Stephens, John James	Mr. Longstaff	Hereford
1862	Stewart, Robert	Mr. Stewart	Edinburgh
1863	Stiles, Mathew Henry	Messrs. Garratt	Rugby
1856	Stokes, Edward H.	Messrs. Lea & Co.	Malvern
1859	Stokes, Walter Edw.	Mr. Boully	London
1857	Stone, George	Mr. Tonge	York
1858	Stretton, Charles	Mr. Parker	Derby
1860	Sumner, Charles	Mr. Hill	Sheffield
1864	Swift, William Philip	Mr. Swift	Spalding
1853	Swift, William	Mr. Judson	Ripon
1862	Sykes, Edwin J.	Mr. Greaves	Bakewell
1857	Syer, John Witham	Mr. King	Soham
1859	Sutcliffe, J. Clarkson	Mr. Strachan	Barnsley
1856	Tanner, Augustus F.	Mr. Dickinson	London
1861	Tarner, Alfred P.	Mr. Blades	London
1862	Taylor, Henry Hylton	Mr. Taylor	Middlesborough
1855	Teed, David	Mr. Pasmore	Exeter
1854	Thomas, George S.	Mr. Outhwaite	Bradford
1861	Thomas, John Ashlin	Mr. Coupland	Harrogate
1856	Thomson, Denzil	Mr. Witherington	Worcester
1858	Thomson, George G.	Messrs. Macfarlan	Edinburgh
1862	Thorn, John James	Mr. Jackson	Crediton
1862	Thurston, Frederick	Messrs. Grimwade	Ipswich
1860	Topliss, Richard	Mr. Brearey	Douglas
1856	Towerzey, Alfred G.	Mr. Towerzey	London
1857	Trewavas, Richard J.	Mr. Job	Truro
1856	Trotter, Joseph	Mr. Brown	York
1857	Truman, George F.	Mr. Wellington	Oakham
1853	Turner, John	Mr. Payne	Alesbury
1864	Turnbull, Thomas Collings	Mr. Reading	Warwick
1856	Twinberrow, James K.	Mr. Twinberrow	London
1859	Vacher, A.	Messrs. Bullock & Reynolds	London
1855	Vooght, William	Mr. Twinberrow	London
1846	Wakefield, Cecil H.	Messrs. Lea & Co.	Worcester
1861	Walker, Alfred	Messrs. Durant	Dorking
1849	Walker, Charles	Mr. Walker	Hogthorpe
1857	Walker, George	Mr. Goodall	Derby
1854	Walker, Joseph	Mr. Witherington	Worcester

Date of Registration.	NAME.	RESIDING WITH	TOWN.
1861	Walker, Samuel	Mr. Wilson	Sheffield
1861	Walker, Walter T.	Mr. T. Hazell	Maidstone
1859	Walker, William H.	Mr. Headley	Bridlington Quay
1857	Wall, John Thomas	Mr. Butcher	Cheltenham
1853	Walls, Thomas	Mr. Barber	Liverpool
1855	Walton, Ralph	Mr. Ritson	Sunderland
1845	Warner, George Thomas		Nottingham
1857	Warren, Thomas P. B.	Mr. Pasmore	Exeter
1858	Waters, Alexander	Mr. Corrie	Bedford
1860	Watkins, Richard	Mr. Fowler	London
1857	Watson, Thomas D.	Messrs. Martindale & Son	Carlisle
1861	Watts, Charles C.	Mr. Clarke	Richmond, S.W.
1859	Wearing, R. Hodgson	Mr. Wearing	Liverpool
1857	Webber, Charles F.	Mr. Edwards	Sidmouth
1859	Webster, George O.	Mr. Seddon	Manchester
1858	Webster, George W.	Mr. Webster	Warrington
1861	Welch, Thomas Kemp	Messrs. Randall & Son	Southampton
1853	Wheeler, James	Mr. Payne	Aylesbury
1855	Wheeler, Joseph W.	Mr. Owen	London
1859	White, Alfred	Mr. Mount	Canterbury
1862	White, James Walter	Mr. Groves	Weymouth
1856	White, John G.	Mr. Ransome	Hitchin
1861	White, William	Mr. Bottle	Dover
1856	Whitehouse, George H.	Mr. Tonge	York
1857	Wigginton, Joseph	Mr. White	Nottingham
1862	Wilkinson, James	Mr. Bartlett	Chelsea
1858	Willan, James R.	Mr. Pratt	Wolverhampton
1850	Willcox, John W.	Mr. Hollier	Dudley
1860	Williams, Robert H.	Mr. Jones	Rhyl
1860	Williams, W. P.	Messrs. Williams & Fitzhugh	Nottingham
1863	Wilmot, Benjamin	Mr. Cottingham	Lincoln
1859	Wilson, Francis	Mr. Lord	Rochdale
1852	Wilson, William	Mr. Rainey	Spilsby
1864	Wilson, Thos. Davison	Messrs. Dobinson & Son	Sunderland
1864	Wilson, John B.	Mr. Mullock	Birkenhead
1856	Witherington, Henry	Mr. Witherington	Worcester
1857	Wood, Albert	Mr. Watkins	Walsall
1853	Wood, Edmund	Mr. Pooley	Bath
1862	Wood, Frederick	Mr. Glass	Cheltenham
1854	Wood, John Robert	Mr. Simmonds	Boston
1861	Woodcock, James	Mr. Cutting	Leamington
1864	Woodstock, Charles Edmund	Mr. Hawkins	Southampton
1863	Wylde, Samuel	Mr. Heaton	Manchester
1858	Wyman, John	Mr. Gulliver	Lutterworth
1855	Yerworth, Edmund	Mr. Binge	Pimlico
1857	Young, John	Mr. Mackay	Galashiels

LOCAL SECRETARIES, 1864-65.*

Aberdeen	Davidson, Charles
Abingdon	Ballard, Edwin
Andover	Dyson, John
Anglesea	Jones, Henry
Ashton-under-Lyne	Bostock, William
Aylesbury	Dickins, Rowland
Banbury	Beesley, Thomas
Barnstaple	Cotton, Gilbert K.
Bath	Pooley, John C.
Bedford	Anthony, Jacob
Belper	Brown, Charles
Berwick	Carr, William G.
Beverley	Hobson, Charles
Bewdley	Newman, Robert
Bilston	White, Thomas
Birkenhead	Jones, Charles
Birmingham	Southall, William, jun.
Blackburn	Booth, James
Bodmin	Williams, Joseph D.
Bolton	Dutton, George
Boston	Simonds, William
Bradford (Yorks.)	Pratt, John
Bridgewater	Payne, Reuben C.
Bridgnorth	Deighton, Thomas M.
Bridlington	Headley, Morris
Bridport	Beach, Thomas
Brighton	Gwatkin, James T.
Bristol	Stoddart, William W.
Buckingham	Sirett, George
Burnley	Cowgill, Brian
Bury St. Edmunds	Portway, John
Cambridge	Deck, Arthur
Canterbury	Hall, John R.
Cardiff	Joy, Francis W.
Cardigan	Davies, David
Carlisle	Moss, William
Carmarthen	Davies, Richard M.
Carnarvon	Griffiths, Owen
Chatham	French, Gabriel
Chelmsford	Baker, Charles P.
Cheltenham	Glass, John T.
Chertsey	Boyce, John P.
Chester	Bowers, Thomas
Chichester	Pratt, John
Christchurch	Judd, William
Cirencester	Mason, Joseph W.
Cockermouth	Bowerbank, Joseph
Colchester	Manthorp, Samuel
Congleton	Goode, Charles
Coventry	Wyley, John
Croydon	Crafton, Ralph
Darlington	Teasdale, Thos. B.
Dartmouth	Rees, William H.
Denbigh	Bancroft, John J.
Deptford	Wickham, William
Derby	Bloor, Joseph
Devizes	Madge, James C.
Devonport	Row, Charles
Doncaster	Dunhill, William
Dorchester	Davis, John
Dorking	Clark, William W.
Dover	Bottle, Alexander
Droitwich	Green, John
Dudley	Hollier, Elliot
Dundee	Laird, William
Dunfermline	Stiell, Gavin
Durham	Trueman, William
Edinburgh	Mackay, John
Evesham	Dingley, Richard L.
Exeter	Palk, John
Eye	Bishop, Robert
Forfar	Rankin, James A.
Falmouth	Newman, Walter
Flint	Roose, Robert
Glasgow	Murdoch, James
Gloucester	Pearce, Thomas
Goole	Chantry, George
Grantham	Hall, Thomas
Guildford	Martin, E. W.
Guernsey	Arnold, Adolphus
Halifax	Jennings, William
Harrogate	Coupland, Joseph
Harwich	Bevan, Charles F.
Hastings	Amoore, Charles
Haverfordwest	Saunders, David P.
Helston	Guy, Guy
Hereford	Jennings, Reginald
Hertford	Lines, George
Honiton	Rogers, J. R.
Horncastle	Elsey, John
Horsham	Williams, Philip
Huddersfield	Hall, George
Hull	Baynes, James
Huntingdon	Bryant, William
Hyde (Cheshire)	Brocklehurst, James
Hythe	Thomas, James
Ipswich	Hayward, Charles F.
Jersey	Ereaut, John
Kendal	Metcalfe, John Sykes
Kidderminster	Steward, Josiah
Kilmarnock	Rankin, William
King's Lynn	Wigg, John G.
Kingston on Thames	Gould, Frederick
Lancaster	Whimpray, John
Launceston	Eyre, Thomas S.
Leamington	Colbeck, Geo. R.

* Local Secretaries are appointed in all Towns in Great Britain which return a Member or Members to Parliament; and in such other Towns as contain not less than Three Members of the Society.

Leeds	Reynolds, Richd.	Sandwich	Duncan, F. M.
Leicester	Cooper, Thomas	Scarborough	Whitfield, John
Leighton Buzzard	Readman, William	Selby	Colton, Thomas
Leominster	Davis, D. Frederick	Shaftesbury	Powell, John
Lewes	Martin, Thomas	Sheffield	Radley, William V.
Lincoln	Peppercorn, Benj.	Shields, North	Brown, William H.
Liskeard	Eliott, Samuel	Shields, South	Mays, Robert J. J.
Liverpool	Edwards, John B.	Southampton	Palk, Edward
Ludlow	Wells, Edwin	Shrewsbury	Cross, William F.
Lyme Regis	Thornton, Edward	Southport	Garside, Burdett
Lymington	Allen, Adam U.	St. Albans	Davenport, Edward
Macclesfield	Smallwood, J. W.	St. Leonards	Davis, John O.
Maidenhead	Thompson, Chas. H.	Stafford	Fowke, George
Maidstone	Argles, Henry	Staleybridge	Brierley, Richard
Maldon	Wallworth, David	Stamford	Patterson, George
Malmesbury	Walker, William	Stockport	Shaw, A. H.
Manchester & Salford	Wilkinson, William	Stockton	Brayshay, Wm. B.
Margate	Dyer, John	Stourbridge	Bland, John H.
Mauritius	Baschet, Geo. C.	Stoke-on-Trent	Adams, J. H.
Melton Mowbray	Leadbetter, William	Stroud	Blake, William F.
Merthyr Tydfil	Smyth, Walter	Sunderland	Ritson, John
Monmouth	Dawe, Sampson	Swansea	Brend, Thomas
Narberth	Jones, David	Taunton	Pring, Walter
Newark	Harvey, John	Tavistock	Gill, William
Newcastle-un.-Lyne	Cartwright, William	Tewkesbury	Wilkes, Seth M.
Newcastle-on-Tyne	Brady, Henry B.	Thetford	Cronshey, James
Newport (Monm.)	Jones, Thomas J.	Thirsk	Thompson, John
Northallerton	Warrior, William	Tiverton	Bond, L. V.
Northampton	Barry, Edwin	Torquay	Glanfield, George
Norwich	Sutton, Francis	Truro	James, John
Nottingham	Atherton, J. H.	Tunbridge Wells	Gardener, Charles.
Oldham	Hargraves, H. L.	Uxbridge	Chave, John
Oswestry	Smale, Richard B.	Wakefield	Gissing, Thomas W.
Ox ord	Walsh, Edward	Walsall	Watkins, George H.
Penrith	Wilson, Joseph	Wallingford	Payne, Sidney
Penzance	Cornish, Henry R.	Wareham	Randall, Thomas
Perth	Dandie, David	Warrington	Redmayne, Christr.
Peterborough	Parnell, John	Warwick	Reading, R. G.
Plymouth	Gibbons, William	Wenlock, Much	Edwards, William
Pontefract	Priestlay, Henry	Westbury	Taylor, Stephen
Poole	Penney, William	Wandsworth	Nind, George
Portsmouth	Rastrick, James L.	Warminster	Toone, J. V.
Preston	Houghton, William	Weston-super-Mare	Rich, Thomas
Ramsgate	Morton, Henry	Weymouth	Barling, Thomas
Reading	Cooper, Lewis	Whitehaven	Randleson, William
Retford	Baker, William	Wigan	Barnish, E. H.
Richmond (Surrey)	Hopwood, Henry S	Wilton	Tuck, John
Richmond (Yorks.)	Thompson, Thomas	Winchester	Powell, Edward
Ripon	Judson, Thomas	Windsor	Russell, C. J. L.
Rochdale	Taylor, Edward	Wolverhampton	Brevitt, W. Y.
Rochester	King, Thomas S.	Woolwich	Rastrick, John A.
Rothesay	Duncan, William	Worcester	Witherington, T.
Rugby	Garratt, John C.	Worthing	Cortis, Charles
Ryde	Wavell, John	Wycombe	Hall, John B.
Rye	Plomley, J. F.	Woodbridge	Smith, James R.
Reigate	Forbes, William	Yarmouth	Poll, William S.
Salisbury	Atkins, Samuel R.	York	Cooper, Thomas

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. V.—No. I.—JULY 1st, 1863.

PROPOSED NEW MEDICAL BILL, AFFECTING PHARMACY.

A Committee of the General Council of Medical Education and Registration has recently been considering the provisions of the Act under which the Medical Council is appointed, with a view to its amendment, and the Report of this Committee has just been presented. It recommends to the Council to apply to Parliament for a new Medical Act, embodying all the principal provisions of the Act of 1858, entitled "An Act to Regulate the Qualifications of Practitioners in Medicine and Surgery," but with some important alterations and additions. The proposed new Medical Bill involves questions of such vast importance to the pharmaceutical body, that we publish it entire. at page 38, in the form in which it appears on the minutes of the Medical Council,—the several clauses of the Bill being placed in columns beside those of the existing Medical Act. It will be seen that the Medical Council propose to include pharmacy among the departments of medical practice over which they are to exercise control: this appears in the preamble to the new Bill. Then, in Section xx., it is provided that the General Council shall lay down such regulations respecting the education and examination of practitioners in pharmacy as may appear to them fitted to ensure adequate knowledge and skill in this department. Those who conform to these regulations will be registered under the Act. By Section xxxi., "Every person registered under this Act shall be entitled, according to his qualification or qualifications, to practise medicine, or surgery, or pharmacy; or medicine, and surgery, and pharmacy, as the case may be," etc.

It is unnecessary for us to do more, on the present occasion, than to lay before our readers a statement of the propositions affecting pharmacy which have emanated from the Medical Council. These propositions have been submitted to all the medical licensing bodies throughout the country for their opinions upon them, and they may be expected to undergo some modifications before they are submitted to Parliament for the sanction of the legislature. In their present form they comprise,—

1. A general system of pharmaceutical education and examination, to be regulated by the Medical Council.

2. The registration of all persons qualified to practise pharmacy, as tested by such examinations.

3. The restriction of the right to dispense or compound the prescriptions of physicians or surgeons, to qualified practitioners in pharmacy, and the imposition of a penalty upon those who shall keep open shop for compounding medicines without having passed the required examination.

4. The appointment by the Medical Council of inspectors, whose duty it shall be to see that the provisions of the Act, affecting pharmacy, are duly carried into effect.

5. The prohibition of the sale of all secret remedies, and the imposition of a penalty for selling any patent or quack medicine, unless a sworn certificate of the composition of such medicine be exposed for inspection in the shop or place where it is sold.

These propositions are surely of sufficient importance to demand and to ensure the immediate and serious attention of the whole pharmaceutical body. We hail the principle of the proposed measure as correct, and there will be ample time for the consideration of the details; but we may observe that the Medical Council are pursuing the same course with us as that originally taken with regard to the physicians, surgeons, and apothecaries.

THE BRITISH PHARMACOPŒIA.

It is announced by the Committee to whom the duty of preparing the National Pharmacopœia has been entrusted by the Medical Council, that the work will be published not later than October next. It will be printed in two forms, the octavo and the duodecimo, the former selling at 7*s.* 6*d.* and the latter at 5*s.*

It is arranged that the publication of the Pharmacopœia shall be preceded by an introductory work, written by Dr. Christison, the object of which will be to explain the forthcoming Pharmacopœia, showing its composition, the changes introduced, and the necessity under which the members of the several branches of the medical profession will lie of making themselves acquainted with the British Pharmacopœia, in place of the Pharmacopœias which it is to supersede.

The system of weights employed in the new work is that which was adopted by a vote of the Medical Council in the latter part of last year, when it was resolved:—

> "That the weights used in the British Pharmacopœia be the imperial, or avoirdupois, pound, ounce, and grain; and that the terms 'drachm' and 'scruple,' as designating specific weights, be abolished."

The Committee, in reporting to the General Council on the 1st of June last, say, with reference to the Bill now before Parliament on the subject of weights and measures:—"The Council will observe that it is quite otherwise circumstanced in respect to this Bill than when it came to a decision last October on the question whether the French metrical system of weights and measures should be adopted at that time as the system of pharmacy in this country. The Committee therefore beg to call the attention of the Council to the approaching proceedings in Parliament; but they leave it to the Council itself to decide whether any and what steps should be taken by the Council in the present position of this important question."

On subsequently considering this report, the Council resolved:—

> "That it be an instruction to the Executive Committee to watch the progress of the Bill on Weights and Measures now before Parliament, and, in the event of its passing the second reading, to take such steps, by petition in the name of the Council, or otherwise, as may seem to them best calculated to prevent the enactment of any statutory restriction or obligation affecting the use of weights and measures in pharmacy, unless with such provisions as shall obviate the risk of its inconvenient or premature enforcement."

The Council have also agreed to adopt the following recommendations of the Special Pharmacopœia Committee, with the view of providing for the preparation and publication of new editions of the Pharmacopœia:—

"The Committee, on considering what measures may be now recommended to the Council, have been impressed with the recommendation of the Chairman of the Pharmacopœia Committee, that the improvements in medicine and pharmacy ought not to be allowed to accumulate long without being introduced by

authority to the medical profession at large; and that therefore either a supplement or new edition of the Pharmacopœia ought to be brought out every five years on an average; and that for this purpose a charge should be given by the Council to one or more competent persons to keep up the necessary information for the Pharmacopœia on a level with advancing knowledge from month to month, so that the requisite changes might be supplied to the Council within a very short period after demand."

To this end the Committee advise that—

1. In each capital of the three divisions of the kingdom respectively, the Branch Council should appoint a person to undertake this duty, who is a medical practitioner, acquainted with the natural history and chemistry of pharmacy.

2. That it should be an instruction to these gentlemen to invite information as to improvements in the Pharmacopœia from the medical, surgical, and pharmaceutical bodies of the several divisions of the country.

3. That, under the sanction of the Executive Committee, the Treasurer be empowered to pay to each of these gentlemen a sum not exceeding £20 annually, for charges for scientific and practical inquiries.

4. That they should intercommunicate their results half-yearly.

5. That they should be ready every five years to give, at the request of the General Council, their conjoint opinion as to the changes they consider advisable for a new edition, or a supplement of the Pharmacopœia.

6. That the Executive Committee should have charge of editing and publishing such new edition or supplement, after approval by the General Council.

THE POISONED GRAIN BILL.

This Bill, which has been deferred from time to time, now stands for second reading on the 8th of July. Advantage has been taken of the delay to make it even more objectionable than the original Bill, against which the petition of our Society was presented to the House of Commons, and published in the Journal of last month. The professed object of the promoters was in the first instance to prevent the indiscriminate destruction of small birds, but so far as vendors are concerned this is virtually a "*Poison Bill*," and we hope our friends in the country will not relax in their efforts to defeat or amend it. Their agricultural neighbours will be their natural and willing allies in this work. The use of arsenic as a sheep-dressing even, would be difficult; and as an anti-smut preparation for seed corn, sulphate of copper alone is permitted, under this measure.

It is true, that Mr. Paull and Mr. Sclater Booth, who introduced the Bill, have received the remonstrances of the Committee with all courtesy, expressing their desire to make its provisions as little obnoxious as possible, and a full statement of objections has been placed in their hands; but lest their zeal for the sparrows should outweigh their consideration for the farmer and his crops, as well as the chemist and his customers, we would counsel every person interested in the matter to make a strong protest to his Representative in Parliament before the day fixed for the second reading.

A BILL TO PROHIBIT THE SALE AND USE OF POISONED GRAIN OR SEED, OR POISONOUS PREPARATIONS, IN CERTAIN CASES, AND THE DESTRUCTION OF BIRDS NOT ALREADY PROTECTED BY LAW.

Whereas it is expedient to prohibit the sale and use of poisoned grain or seed, or poisonous preparations, in certain cases [and the destruction of birds not already protected by law]: Be it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords spiritual and temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

1. This Act may be cited for all purposes as "The Poisoned Grain Prohibition Act, 1863."

2. From and after the *passing of this Act*, so much of the Act of the fourteenth year of her present Majesty, chapter thirteen, "to regulate the sale of arsenic," as permits the sale and use of arsenic for purposes of agriculture, shall be and the same is hereby repealed.

3. Every person who shall knowingly and wilfully expose or offer for sale or sell any poison or poisonous ingredient or preparation, or any grain or seed which has been so steeped or dipped in poison, or with which poison has been so mixed, as thereby to render the same poisonous and calculated to destroy life, with intent that such poison or poisonous ingredient or preparation, or such grain or seed as aforesaid, should be used for the purpose of injuring or destroying any bird or animal whatever (except vermin, as hereinafter provided and allowed), shall, upon a summary conviction thereof, as hereinafter provided, forfeit any sum not exceeding *ten pounds*.

4. Every person who shall knowingly and wilfully sow, cast, set, lay, put, or place, or cause to be sown, cast, set, laid, put, or placed, in or upon any ground, whether open or enclosed, or in any highway, or in or upon any tree, or the hedges, fences, ditches, or banks of such ground or highway, or in or upon or by the side of any stack of corn, grain, pulse, tares, hay, straw, haulm, stubble, or of any cultivated vegetable produce then upon such ground, or any occupier who shall knowingly permit or suffer to remain exposed in any of such situations, any poison or poisonous ingredient or preparation, or any grain or seed which has been so steeped or dipped in poison, or with which poison has been so mixed, or any meat, carrion, or other thing upon or with which any poison or poisonous ingredient or preparation has been so put or impregnated, as thereby to render such grain, seed, meat, carrion, or other thing poisonous and calculated to destroy the life of or injure any bird or animal whatever (except vermin, as hereinafter provided), shall, upon a summary conviction thereof as hereinafter provided, forfeit any sum not exceeding *ten pounds*.

5. Nothing in this Act shall be deemed to make it unlawful for the occupier of any ground, whether open or enclosed, or of any dwelling-house or other building, to bait, place, or put, or cause to be baited, placed, or put, in or upon any such ground, dwelling-house, or building, any poison or poisonous ingredient or preparation with the sole intent of destroying rats, mice, or other vermin, provided that, in the case of any such ground, such poison or poisonous ingredient or preparation is baited or put in some gin or trap, and in such a manner as that no bird or other animal can gain access thereto in order to eat or consume any part thereof.

6. Nothing in this Act shall prohibit, for use in agriculture, the exposing or offering for sale or selling, or the sowing or setting, of any grain or seed which has been steeped or dipped in, or with which has been mixed, a solution of sulphate of copper or blue vitriol, in the proportion of one gallon of water at the least to one pound weight of sulphate of copper or blue vitriol, and so in proportion for any greater or less quantity.

7. This Act shall not extend to the sale of any poison when the same forms part of the ingredients of any medicine required to be made up or compounded according to the prescription of a physician, surgeon, or apothecary, registered under "The Medical Act, 1858," or when such poison is required for use in art, or in the process of printing, dyeing, bleaching, or otherwise of any manufactured goods, or to the sale of any poison or poisonous ingredient or preparation by wholesale to retail dealers, upon orders in writing in the ordinary course of wholesale dealing.

8. This Act shall not affect any of the provisions of the several Acts of Parliament now in force respectively throughout the United Kingdom relating to game, or to certificates or licenses to kill or deal in game, or to the destruction, preservation, or prevention of trespasses in pursuit of game.

9. All penalties imposed by this Act may be recovered in England or Ireland before two Justices of the Peace, and in Scotland before two Justices of the Peace or the Sheriff; and for that purpose in England and Scotland the provisions of the Act of the eleventh and twelfth years of her present Majesty, chapter forty-three, and in Ireland, the Petty Sessions (Ireland) Act, 1851," shall extend and apply to this Act, and to all proceedings in relation thereto; and it shall not in any such proceedings be necessary to allege or prove the bird or animal (as the case may be), or the ground where an offence is committed, to be the property of or occupied by any person: Provided always, that the informer or prosecutor (not being a constable or peace officer) in any such proceeding shall be entitled at the discretion of the convicting Justices or Sheriff to one moiety of any

penalty recovered under the aforesaid enactments: Provided also, that every informer or prosecutor, and every person who shall give evidence against any other person proceeded against under this Act, shall be freed and discharged from any such penalty which he may have incurred for or by reason of his having participated or aided in the commission of the offence with respect to which he shall so inform or prosecute or give evidence, provided the information against such other person has been laid, or such evidence has been given, before the laying of any information (if any) against such informer, prosecutor, or witness for the recovery of any penalty he may have so incurred.

While going through press we find that a Bill has been introduced in the Commons by Lord Raynham for regulating the sale of poisons, and it stands for second reading on the 30th of June. This Bill is not yet printed, and we cannot therefore give particulars.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *3rd June*, 1863,

Present—Messrs. Bird, Bucklee, Deane, George Edwards, J. B. Edwards, Evans, Hanbury, Haselden, Hills, Horner, Meggeson, Morson, Proctor, Reynolds, Sandford, Savage, Squire, Standring, and Waugh,—being the first meeting after the anniversary—the following Officers of the Society were elected:—

George Webb Sandford .... *President.*
Thomas Hyde Hills .... *Vice-President.*
Daniel Bell Hanbury .... *Treasurer.*
Elias Bremridge................................ *Secretary and Registrar.*

LOCAL SECRETARIES.

The Scrutineers' Report of their investigation of the voting-papers returned for the election of Local Secretaries having been read, it was resolved—

"1. That, for the efficient working of the Society, it is desirable that there should be a Local Secretary in each city and borough in England, Wales, and Scotland, which returns a Member or Members to Parliament; also, in every other town in which there are not less than three Members of the Society.

"2. That in those towns from which no returns have been made, the former Secretar be re-appointed for the ensuing year.

"3. That those Members having a majority of votes, according to the Scrutineers list (in case of an equality of votes, preference being given to the Local Secretary of last year, if he be one of the equals), be appointed for their respective localities.

"4. That all these Members on the List so arranged and now presented, be appointed Local Secretaries for the ensuing year, and that the said List be published in the July number of the Journal and Transactions.

"Resolved,—That the Local Secretaries throughout the country be requested to furnish the Overseers in their respective parishes with lists of Pharmaceutical Chemists in due time, with a view to secure their right of exemption from serving on juries under the 'Juries Act, 1862,' and for this purpose the List published in the July number of the Society's Transactions be taken as authentic."

BELL SCHOLARSHIPS.

"Resolved,—That the successful Candidates for the Bell Scholarship, at the Examination on the 25th of August next, have gratuitous instruction in the Laboratory for the Session 1863-64."

The following were elected

MEMBERS.

London......................... William John Beaton.
London... .... Robert Hooper Harrison.

Also the following were elected

HONORARY AND CORRESPONDING MEMBERS.

CONSTANTINOPLE ....Fayk Pacha (Francis Della Sudda).
CALCUTTA ....Baboo Kanny Loll Dey.

BENEVOLENT FUND.

The following subscriptions, amounting to £6. 11*s.*, were announced as having been received during the month of May:—

Baynes, James, Hull	£0	5	0
Cocksedge, Henry B., 20, Bucklersbury	0	5	0
Gardener, Ch., Tunbridge Wells	0	5	0
Herring and Co., 40, Aldersgate Street	1	1	0
Hodder, Henry, Bristol	0	5	0
Leadbetter, W., Melton Mowbray	0	5	0
Musson, T. G., Birmingham	0	10	6
Negus, Samuel, Northampton	£0	10	0
Poulton, John, Newton Abbot	0	10	6
Russell, Charles J. L., Windsor	0	10	0
Sagar, Henry, Leeds	0	5	0
Southall, Son, and Dymond, Birmingham	1	1	0
Strawson, Henry, Crewkerne	0	10	6
Thomas, James, Bridge	0	5	0
Watkinson, Thomas, Cinderford	0	2	6

SPECIAL MEETING OF COUNCIL, *June 10th*, 1863.

Present—Messrs. Bird, Bucklee, Hanbury, Haselden, Hills, Morson, Sandford, Squire, and Waugh.

To consider the measures to be adopted in reference to Mr. Ewart's Bill "For Decimalizing our existing system of Weights and Measures."

MAJOR EXAMINATION, *June 17th*, 1863.

Allcock, Christopher ....Nottingham.
Bourdas, John ....London.
Broughton, Samuel Rutter ....Wrexham.
Gras, Marcel Amédée ....Mauritius.
Grundy, Thomas ....London.
Guiot, Louis Edouard ....Mauritius.
Merle, Etenane Nemours ....Mauritius.
Trollope, William Thomas ....Yarmouth.

MINOR EXAMINATION.

Griffith, William Henry ....Bristol.
Lucas, Philip John ....Guildford.
Watts, John ....London.

REGISTERED APPRENTICES.

NAME.	RESIDING WITH.	ADDRESS.
Andrews, George Henley	Mr. Smith	Walworth.
Davies, Daniel Roberts	Mr. Phillips	Carmarthen.
Duncalfe, Richard		Wellington, Salop.
Ellis, Henry	Mr. Roberts	Bayswater.
Goodrham, Edward John	Mr. Crook	Farnham.
Parker, Henry Walker	Mr. Binge	Pimlico.
Parrott, Edward John	Mr. Towle	Manchester.
Rees, Joseph	Mr. Williams	Cardigan.
Rich, George	Mr. Strawson	Crewkerne.
Selle, William	Mr. Charsley	Brixton.
Stiles, Matthew Henry	Messrs. Garratt	Rugby.
Tanner, Benjamin	Mr. Tanner	Exeter.
Wilson, Charles Eugene Davis	Mr. Tyler	Bath.
Wylde, Samuel	Mr. Heaton	Manchester.

EDINBURGH, *June 9th*.

MAJOR EXAMINATION.

Stark, William Geddes ....Dundas, Canada West.

A SPECIAL GENERAL MEETING OF THE PHARMACEUTICAL SOCIETY

Was held, pursuant to notice, at the house of the Society, 17, Bloomsbury Square, on Wednesday, the 10th of June, for the purpose of considering a Bill now before Parliament FOR DECIMALIZING OUR EXISTING SYSTEM OF WEIGHTS AND MEASURES; Mr. SANDFORD, President, in the chair.

The PRESIDENT, in opening the meeting, said they had met in compliance with a resolution passed at the late Anniversary Meeting, to consider what steps should be taken with reference to the Bill before Parliament for introducing a new system of weights and measures into this country. The subject had been brought under the notice of the Council and of the general meeting of members by his predecessor, Mr. Squire, and he was sorry that gentleman did not occupy the chair on the present occasion, as he had given much attention to the question they had to discuss. This, however, was not the first time they had met to discuss the subject of weights and measures. He recollected that some two or three years ago a proposition was made to alter the weights used in pharmacy, but that was only a proposition to shift from one uncertain standard to another; and the opinion then expressed was, that if any change were made, it should be to the metrical system at once. He therefore thought the measure now proposed would meet with their general approval, as it was almost universally admitted that the French metrical system was superior to old systems existing in this country. There were some few exceptions taken to parts of the metrical system, as, for instance, he had heard it objected that the proposed new yard or metre, which would be thirty-nine inches and a fraction, would be an inconvenient measure for use by linendrapers with short arms. That the weights and measures in use in this country were defective and unsatisfactory was, he thought, beyond all question. This had been proved by the difficulty experienced in restoring the standard that was destroyed when the Houses of Parliament were burnt down. The commissioners then appointed had, it was true, restored the standard after great labour, but they had stopped short of establishing a system upon a scientific basis. There formerly existed great discrepancies in the weights and measures used for different purposes. Thus, they had a beer-measure and a wine and spirit-measure, which differed; the former being larger than the latter, because beer was subject to froth, for which space was allowed. They were told that in Japan fans and mats were units of measure, and although they might be disposed to ridicule such standards, their English measures were in their origin equally uncertain. Thus the inch was originally estimated by four barleycorns placed side by side, and afterwards by three barleycorns placed end to end. Surely the French system was superior to this, being based upon a measurement that was not subject to variation. He had, to be sure, read a work written to prove that the earth was increasing in size, and that its circumference was found sensibly greater at intervals of fifty years. It was generally admitted, however, that the French metre was a good and reliable standard, and he thought that system was the best that had been introduced,—far superior to the English. Even the imperial weights and measures of this country, which were now established by law, were but a slight improvement upon the state of things previously existing, and as they were not applicable to all the purposes of pharmacy, a separate system had to be used in medicine, which was a source of much confusion. Almost the only chance there appeared to be of effecting a real improvement in the existing system of weights and measures in this country, was by passing the Bill now before Parliament, and he thought it was well worth the consideration of the meeting whether they should not petition the Legislature in favour of this measure.

Mr. SQUIRE supposed it would be expected, as the proposition for holding the

meeting had originated with him, that he should say a few words on the subject. He had taken great interest in the movement in favour of the metric system of weights and measures for several years past, and as a member of the Pharmacopœia Committee, he had pressed the subject on the notice of those with whom he was associated, and advocated the introduction of the new system into the Pharmacopœia. At that time, however, they were not prepared for its adoption, although the London Committee had gone so far as to sanction the metric weights and measures being put in a separate column opposite the others. He thought this was a step in the right direction; but afterwards, when the conference between the three committees took place in Edinburgh, the decision of the London Committee was altered, and it was determined that the metric system, with its equivalents in English weights and measures, should be given in a table at the beginning of the book. He thought the new system, if generally adopted, would save a great deal of labour to the rising generation, for they would no longer have to learn the number of grains in a scruple, of scruples in a drachm, and of drachms in an ounce, nor to learn the difference between the ounce and pound in the apothecaries and the avoirdupois weights. In the metric system the divisions and multiplications being all by ten, the subject and the calculations were much simplified. In practice, too, he thought the advantages on the side of the metric system would greatly overbalance the little inconveniences and perplexities that might attend a change of systems. In the article on the subject in the 'Pharmaceutical Journal,' it was remarked that the new acre, being equal to about two and a half of our present acres, men would find their possessions apparently reduced in extent. Thus, if he had an estate of five hundred acres, it was something to speak of, but under the new system it would be reduced to two hundred acres. Some men might be influenced in their opinion by this effect, but the difference in the values of the acres would soon come to be known. It was thought by some that confusion might arise from the similarity between the words grain and gram, but he thought there was quite as much liability to error in the use of the symbols by which the scruple, drachm, and ounce were represented. In discussing the subject there, it would be the better course for them to confine their attention to the proposed measure as it affected their own occupations, and its applications to pharmacy and medicine, leaving it to others to consider its effects as applied for the varied purposes for which weights and measures were used. He concluded by moving that the following petition be presented to the House of Commons:—

To the Honourable the Commons of Great Britain and Ireland in Parliament assembled.

The Petition of the Pharmaceutical Society of Great Britain humbly showeth,—

That your Petitioners regard with extreme satisfaction a Bill now before your Honourable House, entitled "A Bill for Decimalizing our existing system of Weights and Measures, and for establishing an Accordance between them and those of Foreign Countries."

That while your Petitioners are fully alive to certain inconveniences which must necessarily attend a time of transition from one system already established to another entirely new, they believe, on full consideration, that the advantages likely to arise from the change would fully compensate for such inconveniences.

That the Weights and Measures of this country, notwithstanding all the efforts made in the last half-century to regulate them, are still various and unsatisfactory; and your Petitioners are of opinion that this condition arises from the want of a fixed philosophical principle, or starting-point, from which they should all emanate, and increase or diminish by one uniform rate of progression.

That your Petitioners believe the Metrical System in use in France, and now sought to be introduced into Great Britain, is, more than any other, framed on a sound and fixed basis; and that it would be of great advantage to the world in general to adopt that system in lieu of the various arbitrary national systems now in use.

Your Petitioners are more immediately interested in this question as it regards Pharmacy, in which, as well as commerce, an assimilation of the Weights and Measures of all nations would tend greatly to the convenience of Pharmaceutists and the safety of the public.

Your Petitioners are assured that a very few years would suffice to familiarize both Prescribers and Dispensers with the new Weights and Measures, and that the easy multiplication or division of them by the Decimal System, universally applied, would afford such facilities of computation as to recommend it strongly to their adoption; and they are strengthened in this opinion by the invariable practice of English and all other analytical chemists already to state the results of their investigations in decimals.

On all these grounds, therefore, your Petitioners would humbly pray your Honourable House to adopt the system now proposed, with such provisions as may be necessary perfectly to distinguish the new Weights and Measures by name from those already in use in England; and, with a view to prevent accidents, would suggest the propriety of requiring prescribers to designate the Weights and Measures intended in their prescription in *words at full length.*

And your Petitioners, as in duty bound, will ever pray.

Mr. MORSON seconded the motion.

The PRESIDENT said he should be happy to hear any remarks the members present might have to make on the subject before putting the question. He regretted that there were so few present, but no doubt there were some who would wish to address the meeting.

Mr. ANDREWS considered the small attendance was an indication that the members generally were favourable to the proposed change. He had spoken to several members, as well as to others engaged in the trade, and he found that very little objection existed to the measure. Most of those to whom he had spoken appeared to understand the subject and to be prepared for the change, some considering that it would be a great boon. They ought not to be discouraged at the smallness of the meeting, but rather to look upon it as indicating that the members were satisfied to leave the subject in the hands of the Council. If there had been any desire to oppose the measure, they might depend upon it the attendance would have been much more numerous.

The PRESIDENT said that, although the number attending the meeting was small, yet a far greater number had communicated their opinions in writing. The Council had received communications from many parts of the country, including Exeter, Bristol, Brighton, Southampton, Plymouth, Leeds, Lincoln, Nottingham, Sheffield, Wakefield, etc., and at most of these places the opinion of the members appeared to be favourable to the proposed measure for the introduction of the metrical system. He thought it might be well for the Secretary to read some of these communications.

The SECRETARY read the following notices of meetings and of proceedings which had taken place in the country:—

A meeting of the Bristol Pharmaceutical Chemists was held at the Philosophical Institution on Monday, June 8, 1863, to take into consideration the merits of the new Bill for Decimalizing the existing System of Weights and Measures.

Mr. R. W. GILES having been elected Chairman, proceeded to give a brief explanation of the probable bearing the new Bill would have on the interests of the trade generally, remarking especially on the confused state of our present system of weights and measures.

After considerable discussion as to the merits and demerits of the new Bill,

Mr. SCHACHT proposed, and Mr. COOPER seconded, the following resolution, which was carried unanimously:—

"That this meeting acknowledges the necessity of a revision of the National Weights and Measures, and is of opinion that the French system is the most philosophical in principle, whether as regards the unity upon which it is based, or the decimal system upon which it is carried out; and considers that it will be advisable in remodelling the British Weights and Measures to assimilate them to the French system, by which means it may be anticipated that a *universal* European system will be ultimately adopted.

"This meeting, therefore, is of opinion that the Bill now before Parliament is entitled to the support of the Pharmaceutical Society."

Mr. Stoddart, the Local Secretary, was requested to forward to the Society a copy of the above resolution, to be in time for the Special General Meeting of the members, on Wednesday, the 10th inst.

After a cordial vote of thanks to the Chairman, the meeting separated.

At a Special Meeting of the Nottingham Chemists' Association (to which were invited the whole of the trade in the town), held at the Town Hall, Friday evening, the 5th June, it was resolved unanimously,—

"That, in the opinion of this meeting, the Bill now before Parliament, entitled a Bill for Decimalizing our existing system of Weights and Measures, should be adopted, as tending to reduce the complications now existing to one uniform system of the greatest simplicity and completeness.

"This meeting would also recommend the adoption in the new Pharmacopœia of corresponding tables of the old and new system to each preparation showing the relative weights."

At a meeting of the Brighton Chemists' Association, held June 5, 1863, Mr. R. Noakes in the chair,

"Resolved,—That although the Brighton Chemists' Association approve in principle of the introduction of the Decimal System of Weights and Measures, practically they cannot support the Bill now before Parliament.

"Resolved,—That this Association entirely disapproves of the Bill to prohibit the sale and Use of Poisoned Grain or Seed, now before the House."

At a meeting of Pharmaceutical Chemists at Southampton, held June 9, it was resolved unanimously,—

"That, in the opinion of this meeting, it is desirable that the Council of the Pharmaceutical Society should give their active and strenuous support to the Bill now before Parliament for Decimalizing our existing system of Weights and Measures, and for establishing an accordance between them and those of foreign countries.

"Referring to a Bill now before Parliament to prohibit the sale and use of poisoned grain, etc., this meeting is of opinion that, as the necessity for such a measure is understood to arise from the practice of destroying small birds by poison, the only restrictions called for are such as shall restrain this practice."

The Secretary at Exeter had transmitted the names of forty-two persons connected with pharmacy in that town who were favourable to the Bill, and of four who were unfavourable.

The Secretary at Plymouth had sent a statement, in which he said that he had communicated with all the members of the Society in that town, except one who was absent, and he found all but one in favour of the Bill.

At Lincoln, it appeared that the opinion of the trade was about equally divided; the old-established tradesmen wishing things to remain as they were, while the younger men were in favour of the proposed change.

At Taunton, the members of the trade, on being applied to by the Secretary, with only one exception, intimated their approval of the Bill.

At Sheffield, the opinions of members were very diversified, several being decidedly for the Bill, but the majority wishing to avoid the trouble and expense attending the change, although they admitted the superiority of the new system if it could be fairly established.

At Yarmouth, the opinion expressed was opposed to the proposition for petitioning Parliament in favour of the Bill, fears being entertained that the confusion and trouble attending the change would outweigh any prospective advantages.

The following petition has also been forwarded for presentation from the Pharmaceutical Chemists of Newcastle-upon-Tyne:—

"That your petitioners pray that the Bill now before your Honourable House for decimalizing weights and measures, may be passed into a law.

"That further, should such Bill not be passed in its entirety, your petitioners pray that its provisions may become law so far as relates to the compounding of medicines and all the operations of pharmacy."

Mr. Squire observed a gentleman present, Mr. Yates, who had devoted a great deal of attention to the subject of weights and measures, and he felt as-

sured it would be satisfactory to the meeting to hear any observations that gentleman might have to make, especially with reference to the extension of the use of the metric system in foreign countries.

Mr. YATES said he had great pleasure in attending the meeting, and had for many years been gratified in observing the progress made by the Pharmaceutical Society towards the attainment of the objects they had in view, a knowledge of which he had gained from the perusal of their very excellent and ably-conducted journal. He thought the Society had done right in taking up approvingly the measure now before Parliament for decimalizing the weights and measures in this country. It was calculated to confer great benefit on pharmacy, and they would be doing honour to themselves, as a corporate society, by contributing to bring about the proposed change. Their petition would be of great assistance to the movement now making in Parliament; in fact, they could not do themselves a greater honour, nor the science of the country a greater benefit, than by taking the lead in this great movement. The British Society of Architects had, he believed, taken a similar step to that they were then taking. The metric system was becoming general throughout Europe and South America; but its extension in Asia was very limited, and also in Africa. North America generally looked to England, but nearly the whole of South America, with the exception of the barbarous state of Patagonia, had taken to the new system. Peru had adopted it, following the example of Chili and Mexico, and Brazil was also doing the same. With regard to Europe, almost the only countries that stood out were Turkey, Moldavia, and Wallachia. France began the movement sixty years ago, but it met with great impediments during the disturbed state of that country in the early part of the present century. During the following peaceful state of the country, and in Louis Philippe's time, it became fully established, and it had since been making steady progress in that country, so that at the present time it was almost the only system used, and it was only in some remote districts that the old systems were adhered to. Belgium, he believed, adopted it earlier than France, and Holland had adopted the system, although retaining the old names for the different weights and measures. Italy had recently adopted it throughout that part known as United Italy, but it had not penetrated into the Papal States. Spain, some years since, passed a law allowing ten years to elapse before bringing it into operation in that country. Portugal had also adopted it, although some time was allowed before it was brought into operation. The Portuguese had exhibited a magnificent collection of weights and measures illustrative of the system, at our great International Exhibition last year, and this collection was now deposited in the South Kensington Museum. Greece had adopted the system for many years, although the progress it made in that country was slow. Germany had discussed the matter during the last two years, and delegates were appointed to consider the steps to be taken. The result was, that all Germany agreed to its use except Prussia. Lately there had been a meeting in Sweden, and he had received many interesting accounts of the proceedings in that country. One meeting, which consisted of 576 members and persons of the highest consideration, both political and commercial, determined unanimously that it was desirable, not only to introduce the decimal system into the weights and measures, but also into the coins in the countries of Denmark, Sweden, and Norway. Thus most of the countries of Europe had taken up this system, and while they showed a disposition to adopt it, had no wish to deprive France of the glory and merit of being the first to introduce it; but the system had now become cosmopolitan rather than exclusively French. With regard to the Bill before Parliament, he might say that he had been in constant communication with Mr. Ewart, who had charge of the Bill, and other members of Parliament on the subject. It was first introduced simply as a permissive Bill, but it was afterwards thought desirable to make it compulsory after a certain

time, and, as the Bill now stood, it would be compulsory after three years. The second reading was fixed for the 1st of July, and it was desirable that any petitions should be presented before that time.

Mr. MORSON doubted if a merely permissive Act would produce much effect. The public generally would not be likely to pay much attention to it until it was rendered compulsory. He should be glad to know whether Mr. Yates thought that it could be brought into general use in three years.

Mr. YATES said it had been under consideration whether the interval before it became compulsory should be three or five years. He preferred three years, because it might be said that public attention was directed to it from the first introduction of the Bill, and as soon as it should be passed, measures would be taken to have the system taught at schools, so that children and apprentices would become acquainted with it long before they were called upon practically to deal with it. The details of the Bill were, of course, subject to alteration as it went through Committee; and, indeed, he might say that they were open to any suggestions with reference to practical details. Mr. Squire had referred to the alteration the Bill proposed in the values of the acre and mile, and he would observe that at the present time there was great discrepancy in these measures as used in different parts of the country. In Cheshire there were no less than five different acres used, and one of these nearly coincided with the proposed new acre, being nearly equal to two and a half statute acres. At Wigan there were three measures in use; one for measuring land, another for building-ground, and a third for measuring coal underground.

The PRESIDENT said the meeting, he was sure, felt greatly obliged to Mr. Yates for the information he had given them. There was one point to which he wished to direct Mr. Yates's attention, and as he was in frequent communication with Mr. Ewart, the attention of that gentleman might also perhaps be thus drawn to it—namely, the mode of spelling and representing the *gram* in prescriptions. In the Bill it was spelt *gram;* but this, when written, so nearly resembled *grain*, that it was feared its adoption might lead to serious mistakes in dispensing. The last paragraph in the petition had reference to this, and it was thought desirable, not only that the French spelling *gramme* should be retained, but that medical men should be required to write the word in full.

Mr. YATES said this was one of the minor details, which would be dealt with in Committee. He believed he was principally answerable for introducing the German mode of spelling the word *gram* into this country rather than the French, as being more simple and more like an English word. It would certainly be a very desirable thing to get physicians to write a clear and intelligible hand, but he was very much afraid that it could not be effected by Act of Parliament.

The PRESIDENT was about to put the resolution to the meeting, when—

Mr. WAUGH said he felt confident the Society would be disappointed if they did not hear the opinion of one of their Professors who was present, and who, of course, had given some consideration to the subject. On a former occasion, when the Bill was brought under the notice of the Society at its Anniversary Meeting, Professor Redwood expressed a wish that they should have a little time to consider the provisions of the measure, and he was sure he would be willing now to state what opinion he had formed since he had had an opportunity of examining the Bill.

Dr. REDWOOD said he felt very much in the position of one who was unable to say much in favour of the motion which the meeting was apparently about to adopt, and yet he should be sorry to say anything on the other side, nor was he prepared or disposed to do so. He felt, however, much more decidedly and strongly than any of those who had addressed the meeting appeared to feel, the difficulties that stood in the way of carrying out the proposed measure for

changing the whole system of weights and measures throughout this country. He believed these difficulties were vastly greater than they were assumed to be by those who had spoken. It was not a question in which all the merits were on one side and all the demerits on the other. Like most contested questions, there were merits and demerits on both sides. He had always approved in the abstract of the French system. He considered it to be a good and excellent system—to be easily learnt and easily applied—to be, on the whole, the best system existing, or that the wit of man had ever invented for the purpose for which it was intended. But he was not prepared, nevertheless, to say that it was perfect; there were many imperfections in it, some of which arose from its very systematic character. Then, on the other hand, whilst he felt that our system of weights and measures, like other systems in this country, was defective, he was not prepared to admit that it was devoid of all merit; on the contrary, he considered that it possessed some advantages over the French system. It was necessary, therefore, to balance the relative advantages and disadvantages of the two systems; to consider what the balance of advantage was in favour of the proposed new system, and what were the conditions and circumstances under which these advantages could be secured to us. He was prepared to admit that the metrical system was, on the whole, the best, and that its establishment in this country, if it could be completely effected, would be a benefit; but we were bound to consider how far it was practicable to abolish all existing systems and to substitute the new one, and, also, what would be the amount of confusion and inconvenience attending the change. He would have been better satisfied if the petition that was before the meeting had been shorter, and had been expressed in more general and more qualified terms. He could have gone with the petition if it had been simply an expression of approval of the metrical system, but he must hesitate before he could ask the Legislature to attempt to introduce that system by the summary means proposed in the Bill. However good the metrical system might be, supposing even that it were a perfect system, it did not follow that it would be wise to attempt at once to introduce it to the exclusion of all the systems at present in use here, because such an attempt would inevitably fail, and would be attended with much confusion and inconvenience. He had been struck with the remarks made by Mr. Yates in referring to the different measures used in Cheshire under the name of acre. It appeared that there are no less than five acres used there at the present time, yet all but one of these were illegal; and the existence of so many different measures under the same name in the same locality was one of those anomalies the Legislature had failed to remove, although we had been legislating upon the subject for the last thirty or forty years. And would further legislation improve this state of affairs? or were they not rather by the Bill before Parliament going to add an additional element of uncertainty and confusion, which would be sure to last for the next fifty years or more, in spite of any laws that might be passed? He did not consider it possible to bring about such a change as was proposed in three years, nor yet in thirty years, although in making the attempt it would be quite possible, and, as he believed, inevitable, that during the time the change was being forced upon the country, the confusion and uncertainty at present existing in certain localities in the use of weights and measures would be greatly increased. He did not, however, say that the change was not to be made, but that it ought not to be forced upon them hastily, or until they had been prepared for it after a lapse of years. For what, after all, were the benefits they were likely to derive from the new system? Were they not rather theoretical than practical? The system was certainly based upon a good principle; it was consistent throughout, and very complete. And then it was certainly very desirable to have one uniform system of weights and measures throughout the world. This, by promoting and facilitating international communication and the inter-

change of thought, would have a humanizing, socializing, and civilizing effect, and this, in his estimation, was the great and paramount advantage likely to result from the change. But it might equally be said that it would be very desirable to have one universal language; yet if a proposition were made that after the lapse of three years the English language should be abolished and the French or German or Italian language adopted in its stead, such a proposition, although it might be advocated on the ground of its having a humanizing and civilizing tendency, would nevertheless be scouted as an absurdity, because it would be felt to be impracticable. The adoption of one uniform system of weights and measures throughout the world was probably not impracticable, but it involved great difficulties, and it could not be effected suddenly. The change, moreover, would not bring those practical advantages that some persons seemed to anticipate. Thus, for instance, he considered that the weights and measures at present used in pharmacy in this country were more convenient for the purposes of prescribing and dispensing than those of the metrical system. The grain, the scruple, the drachm, and the ounce, were good and convenient measures, well adapted for the purpose to which they were applied. These were natural standards, that had been adopted as most suitable for the measurement of quantities such as they were applied to. Thus, in describing the doses of medicines, a grain of calomel or four grains of antimonial powder could be expressed simply and very intelligibly. Then they spoke of a three-grain or a five-grain blue pill; and the grain was found to be a measure that applied very conveniently in such cases. There was no equally convenient weight to express such quantities in the metrical system. Again, in describing the doses of tinctures and medicines of that sort, the drachm was equally convenient, and this agreed with the teaspoonful. For medicines of a still milder description, the ounce, corresponding to two tablespoonfuls, was as convenient a measure as could be devised, and much more convenient than any in the metrical system. They could substitute no better or more convenient weights and measures for these; and he felt assured, as they had so long been established in use, were so well understood, were so intimately associated with the doses of medicines, and were in every respect so convenient and suitable for the purpose to which they were applied, that they would be continued in use to a greater or less extent for the next thirty, nay, fifty years to come, in spite of any laws that may be passed. He thought, therefore, that they ought not hastily to repudiate the old system, for there was something to be said in favour of it as well as of the new system. In fact, the proposition to abolish all our old measures and substitute new ones would have been received much less favourably than it has been, if it had not been for the attempts which have been made to tamper with those we have been accustomed to. It was doubtful what benefit they, as pharmaceutists, would gain by the change if it were made, but there could be no doubt as to the inconvenience they would suffer in making the change as proposed in the Bill, and therefore he was rather disposed to concur with the resolution that had been sent up from Brighton. There might be a country, somewhere on the other side of our globe, where the atmosphere was more agreeable than it was in this country, where the land was more fertile, and where everything contributed, much more than here, to the prosperity and happiness of the people; but even if it were proved that such a country existed, it did not follow, on such a proposition being made, that they should immediately sell off all they possessed and emigrate to that country. He thought they would hesitate before doing so, and consider the consequences of breaking-up their happy homes, of committing themselves to the waves, with the dangers of a sea-voyage and the difficulties of re-establishing themselves in a foreign land. The case they were dealing with was somewhat similar. It might be that they had an imperfect system of weights and measures, but it was one with which they were thoroughly ac-

quainted, with which all their habits and experiences were associated; one which answered the required purpose, and had many advantages which had been proved by long experience; he thought they ought to hesitate before they decided to abolish this system and committed themselves to a system which, however good and complete it may be, would not be easily substituted and adapted to all the circumstances and conditions under which it was required to be applied. These were his views and opinions with reference to the question before the meeting, which, having been appealed to, he could not do otherwise than express, although he had not intended to speak on the subject, and would not have done so if he had not been called upon, as he was unwilling to interfere with or interrupt the perfect harmony of feeling which appeared to prevail in the meeting.

Mr. WAUGH begged to thank Professor Redwood for the remarks with which he had favoured the meeting, and with which, he might say, he entirely concurred.

Mr. YATES would be glad if he might be allowed to say a few words in reply to the able address which had been delivered by Professor Redwood, whose opinions were entitled to respect, although he did not agree with him in the conclusions he had formed. He would not attempt to discuss the convenience or inconvenience of the weights at present used in pharmacy, but would leave it to practical men who were more capable of dealing with it; but he might say that he understood the present system was beset with difficulties which must be got rid of. There could be no doubt, as Professor Redwood had said, there would be great difficulty in introducing the new system so as to make it generally adopted, but he did not think the difficulty was insuperable. He had devoted great attention to the subject for many years, and had come to the conclusion that it would be possible to make its use almost universal throughout the country in twenty or thirty years. From a correspondence he had with the Astronomer Royal at Brussels, he found that in that country they were obliged to exercise some severity when the law rendering it obligatory first came into effect; but there still were persons, mostly old persons, who would adhere to the old system. A great forbearance had to be exercised in these cases. He had no doubt the same course would have to be adopted in this country. There would of necessity be many old persons bigoted, he might say, to the old system, whom they would never think of compelling to adopt the new system. These, however, would gradually die out, and in thirty years or so the system might be in universal use. There were but few places in France now where the system was not in use. Since he had directed his attention to the subject, he had made frequent inquiries of assistants in druggists' and apothecaries' shops whether they thought they would experience any difficulty in acquiring and applying the metrical system, and he had invariably received the answer, "Not the slightest." With regard to the country in general, the utmost efforts would be used to have the system taught in schools. Children would experience no difficulty in learning it, and they would explain it to their parents, and most persons, he was convinced, would seize it with avidity in consequence of its contrast with the present perplexing and difficult system. Great labour and attention was required in acquiring the present system, and often, after it had been committed to memory, it was forgotten in a few weeks. Of course, on its first introduction it would be necessary to have in the different shops comparative tables to guide the assistants. The cost of these and of the change of weights and measures would only be a question of a few shillings. It was often a troublesome thing to get rid of a bad habit, but he had a very high opinion of the intelligence and ability of those engaged in chemists' shops, and he felt confident they would do all they could to promote the change.

Mr. WAUGH wished to know, as even Mr. Yates assigned twenty or thirty

years to the change from the old to the new system, what was to become of the poor people who, during that time, would be subject to the penalty of forty shillings. For his own part, he had no desire to commit the tradespeople of the country to the tender mercies of common informers, and he thought that a much later date ought to be fixed upon for the Act to become compulsory.

Mr. YATES said the question of time was one of the details of the Bill that would have to be considered in Committee, and as it did not affect the principle of the measure, the second reading might pass without reference to it. His opinion was, that the Act should not be enforced with too strict a hand.

Mr. WAUGH remarked that if the execution of the law depended on Mr. Yates, he should have no fear of the consequences, but he could not say so with reference to the class of persons who went about seeking for cases in which they could recover penalties.

Mr. MORSON thought if the Bill stood as it was at present, even magistrates would have no alternative but to inflict penalties, if it was proved that the old weights and measures were used.

Mr. SYMONDS observed that the penalties were but rarely inflicted under the existing law, which required the use of the imperial weights and measures, although it was notorious that the law was often infringed. It had been remarked, in proof of the difficulty of effecting a change from one system to another, that such change was not yet complete even in France, where the new system was first introduced; but he thought in that country there were both political and religious prejudices which operated against the change. It was well known that the metrical system took its rise at the time of the great French Revolution at the end of the last century, when attempts were made to decimalize, not only the weights and measures and coinage, but even the days of rest, for it was proposed to do away with the Sabbath, and make every tenth day a holiday. This decimalizing tendency was intimately connected with the infidel notions which prevailed at that time, and hence a strong prejudice was likely to arise afterwards against all that originated from it. He looked upon the introduction of the metrical system of weights and measures as a very important object, and he thought they ought to consider the question as citizens, and not merely as pharmaceutists. If the meeting could unanimously adopt the petition, he thought copies of it ought to be sent to the Local Secretaries, with a request that they would use their influence in furthering the object in view.

Dr. W. S. SQUIRE considered the objections that had been urged against the Bill were more apparent than real. Professor Redwood had stated nearly all that could be said on that side of the question; but most of the objections, he thought, admitted of a satisfactory answer. The present system was not so satisfactory as it had been represented. Great confusion and uncertainty existed in many places in the use of weights and measures, and the imperial system, which the law required to be used, was not universally adopted. It had been said that this only proved the uselessness of legislation, and that any attempt to introduce a new system would be equally ineffective, and would only add a new element of confusion; but he contended that there was a great difference between the substitution of one bad system for another, and the substitution of a system which every one admired for one which every one condemned. The metrical system had everything to commend it to the favourable notice of the public; it was easy of comprehension and of application, and its use was calculated to save a vast deal of time and labour, although, to make it complete, the same principle should be applied to the coinage. Fancy a man having to calculate how much 10 tons 7 cwt. 1 quarter 15 pounds would come to at 25*s*. 11*d*. a cwt. It would take half an hour to calculate it, and then it would probably be incorrect, and would have to be done over again. It had been said that the advantages of the metrical system were theoretical rather than practical; but surely the saving of

time and much labour was a practical advantage. He had heard of the large sum of money the Government had paid for a method of piercing holes in the sheets of postage-stamps, with the sole object of saving a little time in separating the stamps from each other; and if that was worth paying for, the saving of so much time as would be effected by the introduction of the metrical system of weights and measures was worth some trouble in its introduction. He did not attach much importance to what had been said respecting the convenience of weights and measures now in use. Our habits were no doubt associated with them, and we had adopted certain conventional methods of comparison, but it would be equally easy to adopt similar methods under the new system when the mind had become familiar with the new standards. At present they had the imperial pint and quart, which was the legal measure, and formed a legal standard of comparison; but the public, nevertheless, used their wine-quarts and other measures, which, although differing from the legal standard, soon came to be estimated by comparison at a money value. So in France, when they had to give up the shilling and deal with the franc, no one experienced any difficulty in making the necessary calculations. Professor Redwood had referred to a happy country on the other side of the globe, and said that, however uncomfortable they might be here, and however encouraging the prospects were there, they would not be disposed to emigrate for fear of the wilderness they would have to pass through on getting there. Now, he had only to say that a great many did emigrate nevertheless, and it might be stated of the metrical system that it was a short cut through the wilderness of figures.

The PRESIDENT then put the question for the adoption of the petition to the meeting, when twelve voted for it, and four against it; the petition was therefore adopted.

Mr. WAUGH wished, on behalf of the minority, to state that the vote which had been taken must not be considered to apply to the respective merits of the existing system and of the metrical system of weights and measures, but to the provisions of the Bill before Parliament. There were several points in the petition and in the Bill which he did not approve of, and therefore he had voted against the resolution.

The PRESIDENT said the petition was an expression of opinion in favour of the system, and was not intended to advocate all the details of the Bill.

Mr. YATES said that none of the details of the measure could be considered as fixed; and from the communications he had had with the promoters of the measure, he felt assured that they would be glad to receive any suggestions calculated to improve the details of the Bill.

A vote of thanks having been passed to the President, and duly acknowledged, the meeting separated.

PROVINCIAL TRANSACTIONS.

LIVERPOOL CHEMISTS' ASSOCIATION.

The concluding meeting of the session was held on Thursday evening, May 28th, at the Royal Institution, Colquett Street, the President, J. Shaw, Esq., in the chair. Mr. Stewart, of Rodney Street, was elected a member; and several donations to the library and museum were announced.

Mr. A. NORMAN TATE, F.C.S., then read a paper on the "Origin of Petroleum." After a few introductory remarks with reference to the countries whence petroleum is obtained, he proceeded to describe the geology of the subject, and said that it was much to be regretted that accurate records had not been kept of all the different strata penetrated in boring the oil wells, as much valuable information might have been obtained; but at present, he said, although much important information had been collected, there was still

plenty of scope for further investigation into the geology of petroleum. The oil is not confined to any particular strata, but is found in rocks of all ages, from the lower Silurian to the Tertiary period inclusive, and is accumulated in fissures in the rocks, and these fissures appear to be more vertical than horizontal, and probably extend through different strata. Mr. Tate then mentioned the different theories which have been propounded respecting the origin of petroleum, and, in the course of his remarks on the distillation theory, described the composition of petroleum and the oils produced by distilling coal at low temperatures; and showed that although the two oils are similar in some respects, yet there is some difference in their chemical composition. Another theory referred to was that which supposes petroleum to have been derived from the decomposition of vegetable matter by a process of decay or fermentation. Reference was likewise made to the probability of petroleum having been, in some cases, of animal origin, this supposition being rendered likely by the fact that the oil is frequently found in the Palæozoic rocks, which contain no traces of land plants, but only the remains of marine plants and animals. The tissues of the lower marine animals are very similar in chemical composition to the woody fibre of plants, and therefore would be likely to yield similar products.

Dr. J. B. Edwards delivered a short address on Mr. Charles Wye Williams' theory of the generation of steam. He supported the theory, and illustrated his remarks by experiment.

A short discussion ensued, in which Mr. Abraham, Mr. Ellerbeck, and other members took part, but they spoke against Mr. Williams's theory.

Some experiments on the Refraction of Light which were to have been performed by Dr. Edwards could not, owing to an accident, be shown.

The President then proceeded to deliver his closing address.*

At the conclusion of the address a vote of thanks was passed to the President for it, and also for his services during the session. The thanks of the meeting were also awarded to Dr. Edwards and Mr. Tate for their communications.

LEEDS CHEMISTS' ASSOCIATION.

The Fifth Ordinary Meeting was held on Thursday evening, May 21, at the Town Hall; the President, T. Harvey, Esq., in the chair.

Mr. William Huggon was elected a Corresponding Member.

Mr. Reynolds exhibited some fine Scammony-roots from the neighbourhood of Aleppo, and Civet from Gondar, in Abyssinia.

The President introduced the subject of "Provincial Minor Examinations." He said that he did not wish to commit the meeting to a formal resolution upon the subject, but it was one that deserved the serious consideration of the members. It was his own conviction that it was desirable, and would soon become necessary for the Pharmaceutical Society to institute "Provincial Examinations," at least for the minor diploma. If the Pharmaceutical Society was to become the one legally constituted and privileged body, representing the chemists and druggists of Great Britain, the rising generation of chemists ought not to be debarred from access to it, as must be the case so long as the minor examination entailed a journey to London and some period of residence there, besides the necessary fees. No doubt many would rest satisfied with this first examination, and would enter into business on the strength of it; while the more qualified and enterprising men would go up to London, pass the major examination, and become full members. The creation of two permanent classes in the same institution might be undesirable *per se;* perhaps, however, careful deliberation might remove the objection to it; but, at any rate, he would regard it as an alternative to be preferred to the one which left outside the pale of the Society the bulk of those who ought to be included.

Mr. Thompson confessed that he was surprised that this subject had not received attention from the Pharmaceutical Society. When he saw every University in England, whether the venerable one of Oxford or that of London as representing more closely modern intellectual advancement, equally engaged in bringing into the provinces facilities for testing the quality of education, he felt that any institution of modern establishment

* The President's Address is unavoidably postponed till next month.—Ed.

ought to have good grounds for the refusal if it declined to follow such distinguished examples, and to offer every facility to country candidates for examination. Leeds was made a local centre for examination by the Universities of Oxford, Cambridge, London, Durham, the Department of Science and Art, and the Society of Arts, and he hoped soon to be able to add, by the Pharmaceutical Society.

Mr. Ward, as teacher to the classes in Chemistry of the Mechanics' Institution, wished distinctly to say that the facilities given for local examination proved an efficient stimulus to the demand for education, and increased both the number of pupils and their zeal for acquiring knowledge.

Mr. Atkinson strongly approved of the proposal as one favourable to provincial members of the Society, who, he thought, should claim its adoption.

Mr. Reynolds remarked that if the Pharmaceutical Society had not moved in the matter it was because they had not been asked to do so. This was purely a question for the country members; it rested with them to take the initiative, and when their views were clearly expressed they would be sure to receive every attention. The arguments based upon the present practice of the universities appeared to him unanswerable. As far as the mass of young men were concerned, they had been trying for years to induce the mountain to come to Mahomet, but now Mahomet must come to the mountain. There might be legal difficulties in the way, but that was only a reason to begin to remove them.

Mr. Reynolds then brought forward the question of "Systematic Scientific Inquiry" as treated in the 'Pharmaceutical Journal' for May, and gave several extracts from the Proceedings of the American Pharmaceutical Association to show the results of the investigations undertaken by its members. He glanced at some subjects which appeared fitting ones for reference to investigators.

Mr. Thompson highly approved the suggestion, and said that, if carried out, an increased want of a good library of reference would be felt. It was essential to keep posted up with the latest results of inquiry.

Mr. Yewdall also supported the idea, and suggested that the Committee be instructed to arrange a series of subjects for investigation, asking the corresponding members of the Society to co-operate. This proposal was adopted, and the Society adjourned its meetings until October.

A Special Meeting of the Leeds Chemists' Association was held at its Library, 5, Cookridge Street, on Monday evening, June 8; the President in the chair. The object of the meeting was to consider two Bills now before the House of Commons, and to express the opinions of the members upon them. The following petition was offered for adoption:—

"That a Bill now before your Honourable House, entitled 'The Poisoned Grain Prohibition Act,' will interfere with the trade of your petitioners, and be likely to expose them to vexatious prosecutions. That, in the belief of your petitioners, no sufficient grounds exist for the provisions of this Bill, which entirely prohibits, under heavy pecuniary penalties, the use of arsenic for the preparation of seed-wheat, and of other poisons which experience has shown to be necessary for the protection of agriculture. That the clause in the Bill permitting the use of poisons to destroy vermin is so framed as to be still to a large extent prohibitive.

"That a Bill interfering with trade, and making illegal means heretofore deemed necessary for agriculture and other useful objects, ought not to pass except on grounds of evident and urgent necessity, and as your petitioners believe no facts have been or can be stated to show this necessity, they beseech your Honourable House not to pass the said Bill into a law."

The petition was moved by Mr. Smeeton, seconded by Mr. Haigh, and adopted after a full discussion, in which Messrs. Stead, Horsfield, Yewdall, and Rimmington (Bradford) took part, and in which the loosely-drawn nature of the Bill was severely commented upon, since it neither defined the poisons which it prohibited nor the "vermin" against which they were allowed to be used. The Association next considered the following draft of a petition:—

"That your petitioners pray that the Bill now before your Honourable House for decimalizing weights and measures may be passed into a law.

"That further, should such Bill not be passed in its entirety, your petitioners pray

that its provisions may become law so far as relates to the compounding of medicines and all the operations of pharmacy."

Moved by Mr. Thompson, seconded by Mr. Brown, and carried. It was also resolved —

"That this Association would respectfully urge upon the General Medical Council that the present opportunity of introducing metric weights and measures into the forthcoming National Pharmacopœia should be embraced."

Moved by Mr. Reynolds, seconded by Mr. R. M. Atkinson. The course adopted by the Association with regard to the Decimal Weights and Measures Bill appears to indicate the direction of a judicious policy in connection with this subject. Much unthinking opposition will doubtless be raised to the general adoption of the measure, and in order that a preliminary trial of the system may be made, it would be an immense advantage that a special purpose like the compounding of medicines, requiring definiteness and accuracy, should be selected.

ORIGINAL AND EXTRACTED ARTICLES.

NEW AMERICAN REMEDIES.

BY PROFESSOR BENTLEY, F.L.S., M.R.C.S. ENG., ETC.

(*Continued from Vol. IV. p.* 497.)

XI. GERANIUM MACULATUM, *LINN.*—SPOTTED CRANESBILL, ALUM-ROOT.

HISTORY.—The rhizome of this plant appears to have been in use as an astringent from the earliest periods, by the Indians of North America; and it is still a highly-valued domestic remedy where astringent medicines are required, by the present inhabitants of the States of North America. It was noticed at an early period by writers on Materia Medica as a useful remedy in dysentery, and was admitted as far back as 1820, into the Primary List of the Materia Medica in the United States Pharmacopœia, in which it is still retained. As a remedy in all cases where astringents are necessary, its reputation may be regarded as established.

SYNONYMS.—This plant is the *Geranium maculatum*, Linn. Sp. Pl. 955; Mich. Fl. Bor. Am. vol. ii. p. 38; Willd. Sp. Pl. iii. 705; Bigelow's Amer. Med. Bot. vol. i. p. 84. tab. 8; Barton's Med. Bot. i. 149. tab. 13; Hook. Fl. Bor. Am. i. p. 115; De Cand. Prod. vol. i. p. 642; Torr. and Gray's Fl. North Amer. vol. i. p. 206; and of Gray's Gen. Fl. Amer. Bor. Orient. vol. ii. p. 128. It is the *Geranium Noveboracense*, Amœn. Acad. vol. iv. p. 522; and the *Geranium batrachioides Americanum maculatum*, etc. of Dillenius. The first name is that by which it is now universally recognised by botanists.* In common language it has been termed Spotted Cranesbill, Crowfoot, Spotted Geranium, Alum-root, etc.

ETYMOLOGY.—The generic name, *Geranium*, is derived from the Greek word *γέρανος*, a *crane*, from a supposed resemblance of the prolonged axis of its fruit to the beak of that bird. The origin of the specific name, *maculatum*, is by no means clear. It is true that the rhizomes, leaves, and petals, have each a somewhat spotted character, but in neither case is this peculiarity very evident. The common names of Spotted Cranesbill and Spotted Geranium are simply translations of the generic and specific ones. That of Crowfoot is derived from the resemblance its leaves bear to some species of the genus *Ranunculus*, which is commonly called Crowfoot; and that of Alum-Root has been given to indicate its astringency.

BOTANY.—The genus *Geranium* is regarded by botanists generally, as the type of the order Geraniaceæ.†

* Figures of the plant may be seen, as noticed above, in Bigelow's 'American Medical Botany,' vol i. tab. 8; in Gray's 'Genera of the Plants of the United States,' vol. ii. p. 128, pl. 150; and in 'American Journal of Pharmacy,' vol. iv. p. 89.

† Lindley's 'Vegetable Kingdom,' p. 493; and Bentley's 'Manual of Botany,' p. 511.

Generic Character.—*Sepals* 5. *Petals* 5, regular, alternate with the sepals. *Stamens* 10, in two series, the five outer opposite to the petals, and shorter than the five interior, which are opposite the sepals, and have glands at the base. *Pistil* of 5 carpels, placed opposite to the petals; *styles* ultimately separating from the 5-angular axis from below upwards, and becoming circinately revolute, smooth, or rarely slightly hairy on their inner surface. *Herbs*, or rarely somewhat of a shrubby character.*

Specific Character.—*Rhizome* perennial, horizontal, more or less branched, fleshy, and of a dark brownish-red, somewhat mottled with green, colour. From the rhizome a number of leaves arise, and one, two, or more, aerial stems. *Aerial stems* annual, erect, roundish or somewhat angular, densely clothed with hairs, which are more or less reflexed, dichotomous above, 1–2 feet high. *Leaves* palmate, with three, five, or seven lobes, the lobes themselves being again variously incised and toothed at their extremities; the petioles and laminæ more or less hairy. The leaves which arise from the rhizome are on long roundish or somewhat angular petioles; those which spring from the aerial stem at the point where it forks are opposite, and with evident petioles; and those which are inserted on the upper part of the stem are either sessile or shortly petiolate. *Stipules* lanceolate, or linear-subulate. *Peduncles* usually 2–flowered, hairy, springing from the forks of the stems. *Bracts* subulate, or linear-lanceolate. *Flowers* on short hairy pedicels of unequal length, generally purple, rarely nearly white. *Calyx* of 5 elliptical or oval-lanceolate sepals; *sepals* ribbed, more or less hairy on their outer surfaces, and smooth on their inner, distinctly awned or mucronate-awned; the inner sepals are frequently, scarcely, if at all, hairy. *Petals* 5, obovate, entire, ciliated at the base, and marked with greenish veins. *Stamens* 10, in two rows of unequal length; the larger stamens alternate with the petals, and furnished with greenish glands at their base; *filaments* enlarged and monadelphous at base; *anthers* oblong, deciduous, purplish. *Ovary* ovate; *styles* as long as the filaments, united; *stigmas* 5, erect at first, and afterwards reflexed. *Fruit* composed of five 1–seeded carpels, which curl upwards on the prolonged axis when ripe, and discharge their seeds.†

Habitat.—This species has an extensive geographical range in North America, where it extends from Canada to the most southern States of America, and west to the Mississippi. It abounds most in low grounds, growing commonly in hedges, thickets, and borders of damp woods. It varies much in height, in the form and incision of its leaves, and in the colour of its flowers. These differences undoubtedly depend upon variations of soil, climate, situation, etc. When growing in favourable situations, it is described as one of the most beautiful of the indigenous plants of the United States, and as well deserving of cultivation.‡ It flowers from April to June.

Collection.—The only part of the plant which is commonly employed as a remedial agent is the rhizome. This should be collected in the autumn months; or early in the spring, before active vegetation has commenced.

GENERAL CHARACTERISTICS.—The part of *Geranium maculatum* which is employed in medicine and for other purposes, is generally designated as the root; but properly, as already noticed with regard to *Podophyllum*, *Hydrastis*, *Sanguinaria*, *Actæa*, etc., it is the rhizome or underground stem, from which the true roots, which are here very small, and hence termed rootlets, arise below. In commercial specimens, these rootlets are commonly absent, although rhizomes with small attached rootlets may occasionally be found.

The *rhizome*, as imported, is usually simple, although rarely it is somewhat

* Lindley's 'Flora Medica,' p. 221; Gray's 'Genera of the Plants of the United States,' vol. ii. pp. 127, 128; and De Candolle's 'Prodromus,' vol. i. p. 639.

† Torrey and Gray's 'Flora of North America,' vol. i. p. 206; Lindley's 'Flora Medica,' p. 221; and 'American Journal of Pharmacy,' vol. iv. p. 90.

‡ Amer. Journ. Pharm. vol. i. p. 170; and vol. iv. p. 90.

branched. It is commonly much twisted, and furnished on its outer surface with numerous thick, hard projections, which vary in length generally, from about a line to a quarter or even half an inch; hence it presents a very irregular and somewhat coralline appearance.

In length it varies from about one inch to three or four inches, averaging one inch and a half to two inches. It is from one-quarter of an inch to a half or rarely three-quarters of an inch in thickness, averaging a little above one-quarter of an inch. It has an irregular, cylindrical shape, and is frequently somewhat flattened on one side. Externally it presents a wrinkled appearance, from the presence of numerous transverse striæ and depressions, and of irregularly longitudinal furrows. Projecting from the surface, also, as just noticed, are numerous hard tubercular expansions, of varying length. Traces of the rootlets and leaves may also be found on some of the rhizomes. The rhizome has a dark-reddish, or umber-brown colour externally, and a reddish-gray or pale flesh-colour internally. It has a compact, firm texture, and a short, close, and in some cases, a resinous-like fracture. A transverse section shows a large central mass of a reddish flesh-colour, surrounded by a thin, dark-brown cortical portion. The rhizome has no evident odour, but it possesses a very astringent taste, without, however, any perceptible bitterness.

COMPOSITION AND CHEMICAL CHARACTERISTICS.—The first-recorded examination of the rhizomes and rootlets of the *Geranium maculatum* is that of Dr. Bigelow, who found that the solution indicated the presence of both tannic and gallic acids. He also states that the solution affords a more abundant precipitate with gelatine, than kino on being similarly treated. He further adds that the solution did not affect litmus; but this is opposed to the experiments of Dr. Staples,* and to those recorded below by myself, for we have both found that the solution had an evident action on litmus. The more complete analysis of the rhizome by Dr. Staples† shows that it contains, besides fibrous substances common to plants, *gallic acid* in large quantity, *tannic acid*, *mucilage* in small proportion, *red colouring-matter*, principally in the external covering of the rhizome, *resin* in small quantity, and a *crystallizable vegetable substance*.

A still more and complete analysis, made by the Messrs. Tilden, of the New York State, North America, gave the following results of the examination of seven thousand grains of the rhizome:‡—

Inorganic matter	1,024	
Organic matter	5,976	
	7,000	
Viz. of		
Albumen	96	grains.
Gum	80	„
Gallic acid	120	„
Tannin	136	„
Colouring-matter	168	„
Extractive	224	„
Pectin	160	„
Sugar	200	„
Starch	240	„
Resin, soluble in ether	224	„
Resin, soluble in alcohol	216	„
Oleo-resin, soluble in ether only	20	„
Chlorophyll	8	„
Soluble salts	320	„
Insoluble salts	704	„
Ligneous, etc.	4,084	„
Total	7,000	grains.

* Amer. Journ. Pharm., vol. i. p. 171. † Id.

‡ Lee on Medicinal Plants, in 'American Journal of Materia Medica,' July, 1859.

It is also stated by these analysts that the tannic and gallic acids of Geranium differ from those of oak-galls in not reddening vegetable blues, and by not passing over in distillation. So far as the reddening of vegetable blues is concerned, as already noticed by us, their experiments do not accord with those of Dr. Staples, nor with our own, as will be seen by referring to the reactions mentioned below.

An infusion of the mixed rhizome and rootlets bruised, in the proportion of one ounce to twenty-four ounces of boiling water, and allowed to macerate for twenty-four hours, had a pale yellowish-red colour; a strong astringent and peculiar taste; and a very faint and peculiar odour. It exhibited the following reactions:—*Blue litmus-paper* was reddened by it; *solution of gelatine* caused a very abundant curdy precipitate; by *tincture of galls* the colour was deepened to a deep reddish-brown, but no precipitate was produced; *solution of persulphate of iron* caused a deep bluish-black coloration, and a copious precipitate of the same colour was slowly deposited; *solution of perchloride of iron* caused nearly the same change in the infusion; *solution of antimoniate of potash* produced an abundant yellowish-brown precipitate; *solution of carbonate of potash* an abundant light brownish-white precipitate; *solution of potash* formed slowly a copious light brownish precipitate; *solution of ferridcyanide of potassium* caused a copious yellow precipitate; *solution of chromate of potash* an abundant dirty yellowish-brown precipitate; *baryta-water* produced an abundant brownish gelatinous-like precipitate; *solution of nitrate of baryta* caused a slow deposition of a slight brownish precipitate; *solution of acetate of lead* rendered the infusion milky, and formed a light, abundant, whitish precipitate; *solution of basic acetate of lead* gave a pinkish hue to the infusion, and produced an abundant, light precipitate; *solution of ammonia* simply deepened the natural colour of the infusion; *solution of oxalate of ammonia* made the colour of the infusion pinkish, and ultimately caused a light, abundant precipitate; *solution of chloride of lime* at first coloured the infusion a deep reddish-brown, but ultimately it became bright yellow, and deposited a very light, copious, yellowish precipitate; *solution of sulphate of copper* produced a plentiful dirty-brown precipitate; *solution of nitrate of silver* an abundant deep reddish-brown powdery precipitate; *solution of bichloride of mercury* caused a very abundant, light, whitish precipitate; *sulphuric acid* caused the infusion to assume a pinkish hue, and to deposit slowly a plentiful precipitate. No very evident changes were produced in the infusion by the addition to it of either *tincture of iodine*, *nitric*, *hydrochloric*, or *acetic acids;* or of the *solutions of ferrocyanide of potassium*, *bichloride of platinum*, *chloride of calcium*, *sulphate of lime*, *sulphate of soda*, or *protochloride of tin*.

No very marked effects were produced upon the freshly-fractured surface or clean section of the rhizome by the application of either *solution of ammonia*, *sulphuric*, *nitric*, or *hydrochloric acids*.

MEDICINAL PROPERTIES AND USES.—Dr Wood says,* "Geranium is one of our best indigenous astringents, and may be employed for all the purposes to which those medicines are applicable. The absence of unpleasant taste and other offensive qualities renders it peculiarly serviceable in the cases of infants and persons of very delicate stomach. Diarrhœa, chronic dysentery, cholera infantum in the latter stages, and the various hæmorrhages, are the forms of disease in which it is most commonly used, and with greatest advantage; but care should be taken, before it is administered, that the condition of the system and of the part affected is such as not to contra-indicate the use of astringents. As an application to indolent ulcers, an injection in gleet and leucorrhœa, a gargle in relaxation of the uvula and aphthous ulcerations of the throat, it answers the same purpose as kino, catechu, and other medicines of the same class." Professor Barton, Dr.

* Wood and Bache's 'United States Dispensatory,' 11th edit. p. 382.

Eberle, and other practitioners of repute in North America, also speak highly of its virtues in cholera infantum, and as a gargle in cynanche tonsillaris, ulcers of the tongue and fauces, etc. Dr. Bigelow says, "It is particularly suited to the treatment of such diseases as continue from debility after the removal of their exciting cause."

Dr. Lee remarks,*—"Dr. Thatcher recommends it as almost a specific in cases of hæmoptysis," and adds, "it has long been regarded by the American Indians as a specific in the venereal affections." The author of 'Positive Medical Agents'† says that, as an astringent, it is as good as kino or rhatany. The powder has been used with success as an application in epistaxis, bleeding after extraction of teeth, etc.

Speaking of the so-called active principle termed *Geranin*, Dr. Grover Coe‡ says that it possesses astringent, styptic, and antiseptic properties, and that it may be employed in dysentery, diarrhœa, hæmoptysis, hæmaturia, passive hæmorrhages, aphthous sore mouth, leucorrhœa, gleet, diabetes, and all affections of the mucous surfaces. He adds,—"Geranin is justly considered one of the most valuable of the vegetable astringents. In its action it differs somewhat from astringents generally, in promoting, instead of suppressing, the secretive power of the mucous surfaces, and leaving them moist and invigorated in their functions. This remedy has been largely employed in the treatment of dysentery, and with more general success than any other astringent. Its use is admissible in all the different stages, although success will be more certain if the bowels are first relieved of their morbid contents, and the functions of the liver corrected." So strong and so universal is the evidence of American medical practitioners in favour of the use of Geranium in all cases where astringents are required, that its value as a remedial agent may be regarded as quite established.

ADMINISTRATION, PREPARATIONS, AND DOSES.—Geranium has been administered internally in powder, decoction, infusion, tincture, extract, resinoid extract (*geranin*), etc.; and externally, in powder, and in the form of the resinoid extract. Water and alcohol are said to extract its virtues.§ The best preparation for internal use we should regard as the hydro-alcoholic extract, as such would contain all its more important properties.

Resinoid Extract of Geranium.—This preparation, under the name of *Geranin*, is one of the so-called concentrated preparations now so extensively employed in America and elsewhere. It is said to be prepared by making a concentrated tincture of geranium rhizome, as in the case of the other resinoid extracts, and proceeding afterwards in the manner already described when treating of them.‖ It contains all the principles which can be extracted by the action of water and alcohol. As generally found, it is in the state of a reddish-brown powder, with an astringent and very slightly bitter and acrid taste, and a pleasant and somewhat aromatic odour.

Decoction of Geranium.—Take of Geranium rhizome and rootlets mixed and bruised, *one ounce;* boiling water, *one pint;* reduce by moderate ebullition to sixteen fluid ounces. When given to children, the decoction is sometimes made with milk instead of water.

Infusion of Geranium.—Take of the bruised rhizome and rootlets of *Geranium maculatum*, *one ounce;* boiling water, *one pint.* Macerate for four hours, and strain.

Tincture of Geranium.—Take of Geranium rhizome and rootlets, bruised,

* Lee on Medicinal Plants, in 'American Journal of Materia Medica,' July, 1859, p. 199.
† 'Positive Medical Agents,' p. 95.
‡ Grover Coe's 'Concentrated Organic Medicines,' pp. 158–163.
§ Wood and Bache's 'United States Dispensatory,' 11th edit. p. 382.
‖ See papers by the author, on *Actæa racemosa*, Pharm. Journ. vol. ii. 2nd ser. p. 462; on *Podophyllum peltatum*, vol. iii. p. 461; and on *Sanguinaria canadensis*, vol. iv. p. 267.

four ounces; proof-spirit, *two pints:* digest for fourteen days, express, and filter. Or the tincture may be made in the ordinary way by percolation.

There are no recognised formulas for the above in the United States Pharmacopœia, but as it is important that some definite preparations should be employed in this country to avoid mistakes and confusion, we give these formulas as likely to answer the purposes for which they may be required.

Doses.—The dose of Geranium rhizome in powder is from *twenty* to *forty grains;* that of Geranin, from *one* to *five* grains; that of the decoction, from *one* to *two fluid ounces;* that of the infusion, from *one* to *three fluid ounces;* and that of the tincture, from *one* to *two drachms.*

ON THE BEST METHODS OF APPLYING THE CALABAR BEAN IN OPHTHALMIC MEDICINE.

BY DANIEL HANBURY, F.L.S.

In the last number of the Pharmaceutical Journal I stated that certain difficulties occur in forming a preparation of the Calabar Bean which can be conveniently applied to the eye. These difficulties arise from the fact that the alcoholic extract which contains the whole of the poisonous principle of the bean* can only be imperfectly dissolved in water, and that its alcoholic solution is inadmissible. There is also another difficulty which occurs with all liquids that are required to be dropped into the eye, and that is, that the flow of tears which instantly follows such an application greatly reduces the amount placed in contact with the membrane,—or at any rate renders it very uncertain.

These considerations have suggested other expedients for applying the remedy, one of which is to use the extract by itself; another is to employ it diffused through paper, after the manner recommended by Mr. J. F. Streatfeild for the application of atropine†; and a third is to use a solution of the extract in glycerine. Each of these methods has certain advantages. The extract, which is prepared by exhausting the finely powdered bean with alcohol sp. gr. ·838 and evaporating the solution, is not a homogeneous body, but contains a small amount of greenish fatty oil which separates as the solution is concentrated. Its action upon the eye is rapid and powerful. The best means of using it is to moisten a camel's hair pencil with water and then with its tip to rub off a minute quantity of extract and apply it to the palpebral conjunctiva of the lower lid:—so applied, its specific action ensues in the course of a few minutes. This method of the direct application of the extract would probably be hardly advisable in any other than professional hands.

The method of applying *atropine* to the eye by soaking a piece of thin bibulous paper of definite size in a known quantity of solution of atropine and then allowing it to dry, has been recommended in this country by Mr. Streatfeild and in France by Mr. Leperdriel‡. Such paper should be cut into small pieces from $\frac{1}{4}$ to $\frac{1}{8}$ of an inch square, the proportion of atropine being so regulated that a single square shall represent a drop of the ordinary solution of two grains to the ounce. Paper prepared on this principle with a solution of Calabar Bean answers extremely well, and promises to afford the most definite method of regulating the quantity of the remedy to be applied. The following is the process which I have adopted. One ounce Troy of the bean, reduced to fine powder, is to be thoroughly exhausted by hot rectified spirit (·838); the solution so ob-

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* Since publishing my former paper, I have ascertained that the finely powdered bean deprived of everything that alcohol would remove, is no longer poisonous to rats.

† *Ophthalmic Hospital Report,* Jan. 1862, p. 310; also *Pharm. Journ.,* Jan. 1863, p. 329.

‡ *Bulletin de la Société de Pharmacie de Bruxelles,* Mars, 1863, p. 93.

tained is to be filtered and evaporated until extract begins to deposit on the bottom of the dish, which will occur when the solution has been reduced to about ten fluid drachms. When cold this solution is to be passed through a small filter, and is then ready for the paper. This may be thin writing paper, the size contained in which has been removed by boiling* ; it should be immersed in the solution four times, and be allowed to drain and dry between each immersion. Of paper thus prepared, a piece measuring ⅛th of an inch square placed within the lower eyelid commences to act in about twenty minutes and continues to produce its effect during several hours. Its presence in the eye occasions no uneasiness beyond that which is attributable to the drug.

A solution of the extract of Calabar Bean in glycerine made in the proportion of 2½ grains of extract in 100 minims of pure glycerine, has also been tried and found to answer well, the glycerine in no way interfering with the action of the extract.

Further experiments may suggest still better preparations: for some hints respecting those here mentioned and for numerous careful observations upon them, I have to thank Mr. Charles John Workman of the Royal London Ophthalmic Hospital, Moorfields, and Mr. Bader of Guy's Hospital.

ON A NATURAL FORMATION OF CARBONATE OF SODA.

BY R. HAINES, M.B., PROFESSOR OF MATERIA MEDICA, GRANT COLLEGE, BOMBAY.

Some months ago a substance was brought to my notice by the Curator of the Economic Museum in this town, Dr. Birdwood, said to be a natural product of the neighbourhood of Aden, and to be used only for mixing with and imparting pungency to snuff. It consisted of irregular, nearly colourless, partly crystalline masses, composed apparently of two distinct portions: one was a brilliant, confusedly crystalline mass, amongst which the angles of cubical crystals could be observed; the other, which seemed to be the upper portion, was a white amorphous substance, of a greasy feel, and rather strong soapy odour, very similar to that of crude borax. By taking portions of a number of lumps, and pounding the whole together, a fair average sample was procured.

Dissolved in water, a colourless solution was obtained, alkaline to test-paper, and effervescing strongly with acids. Supersaturated with nitric acid, it yielded an abundant precipitate with nitrate of silver, a scanty precipitate with chloride of barium, and a slight crystalline precipitate, after some hours, with ammonia and phosphate of soda. A concentrated solution gave no precipitate with chloride of platinum and alcohol. The dry salt being rubbed with sulphuric acid, and then with alcohol, did not impart to the flame of the latter the slightest tint of green. From these experiments it appears that the salt consists of carbonate of soda and chloride of sodium, with traces of sulphuric acid and magnesia, but that it contains neither potash nor boracic acid.

8·668 grammes, dissolved in water, left an insoluble residue of fine sand, weighing ·377 grammes, equal to 4·35 per cent. The filtrate was made up to 100 cubic centimetres. Of this, 10 cubic centimetres required for neutralization of Mohr's normal acid 8·35 cubic centimetres, equivalent to ·1837 grammes of carbonic acid, and to ·44255 grammes of dry carbonate of soda. 50 cubic centimetres of the filtrate were therefore equivalent to ·9185 grammes of carbonic acid, and the whole 100 cubic centimetres to 4·4255 grammes of dry carbonate of soda, or 51·05 per cent.

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* Mr. Streatfeild recommends *green* paper, as *white* paper when soaked with tears is not always easily distinguished from the conjunctiva.

50 cubic centimetres of the same filtrate, treated in a carbonic acid apparatus with sulphuric acid, lost ·915 grammes of carbonic acid. The carbonate is therefore a neutral salt. 4·963 grammes, gently ignited to incipient fusion, lost ·976 grammes, equal to 19·66 per cent.

From these data the following composition is deduced:—

Neutral carbonate of soda	51·05
Common salt, with traces of sulphate of soda and chloride of magnesium ...	24·94
Water and organic matter	19·66
Sand	4·35
	100·00

Subsequent information, obtained through the kindness of Captain Playfair, the Assistant Political Resident at Aden, was to the following effect:—"The substance is found all along the coast to the east of Aden, to an extent of perhaps ten miles, and its quantity is practically unlimited. It is usually found in hollows behind (or beyond) high-water mark, to which the sea-water has access by percolation. There is no demand for it at present, but some months ago sixty to seventy camel-loads a day were brought into Aden, and it met with a ready sale at 2½ rupees. per ten maunds (equal to two shillings a hundredweight). The only use made of it is to mix with snuff, to increase the pungency; rarely, too, it is used for washing clothes. It is variously called by the Arabs *Dukduka*, *Hurka*, and *Kára*."

From the valuable paper published by Mr. H. J. Carter in the Transactions of the Bombay Branch of the Royal Asiatic Society, on the Geology of Arabia, it appears that the whole of the south-east coast of Arabia, from Ras-ul-Had to Bab-ul-Mandib, is capped with nummulitic limestone, pierced at frequent intervals with basaltic effusions, and in many places elevated so as to form lofty and abrupt cliffs, in which, beneath the limestone, other formations are visible. As a result of this formation, the shingle on the coast consists mainly of limestone; and although no specific description of the coast immediately to the east of Aden has been given, there is no reason to doubt that the same peculiarities prevail there. It is then to the percolation of sea-water through a stratum of fragments of limestone that we must attribute the production of the carbonate of soda, by which percolation, probably, a partial interchange of elements has been effected between the chloride of sodium and the carbonate of lime, giving rise to the formation of chloride of calcium and carbonate of soda. It has been long suspected that the natural production of carbonate of soda was dependent on the presence of carbonate of lime, and was brought about somewhat in this way; but what the conditions are under which the separation of the carbonate of soda from the chloride of calcium is effected, without allowing the former to exert its ordinary converse action upon the lime-salt and reproducing carbonate of lime, is a question that would form a very interesting subject of scientific inquiry. This is, I believe, the first time that the natural production of alkali from sea-water itself, without organic agency, has been observed.

It is hardly probable that the production of carbonate of soda in this way is limited to a few miles' distance from Aden. As the shore is so very similar along the whole 1125 miles which form the south-east coast of Arabia, there is a reasonable expectation of finding it at many places elsewhere; and an article so much in request, so easily procured, and with water-carriage close at hand, might yield a fair amount of profit to an enterprising shipper who should collect or purchase it upon the spot.

Bombay.

ACCLIMATIZATION.

BY MR. JOSEPH INCE.

"Blessed are ye that sow beside all waters, that send forth thither the feet of the ox and the ass."—Isaiah xxxii. 20.

*Part II.—The Garden of Acclimatization (Paris).**

A garden of Acclimatization differs essentially from either the Zoological or the Botanical garden, nor is it the result of the two combined; for whereas both these latter are meant to be the living text-books of the subjects to which they are specially devoted, and are just so far perfect as they contain accumulated illustrations of their respective studies, a garden of Acclimatization, having no technical boundary line of science, selects from all living objects whatever of either use or beauty may be deemed worthy of home introduction. Its range is from the Yak to the Silkworm, and from the Lama to the Sponge; to quote its own announcement, "its great object is to acclimatize, to multiply and to distribute to the public, animal or vegetable species which

* Less than half an hour's stroll from St. George's Hospital will lead to a walk which is one of the ornaments of London, and which Paris in all its glory cannot equal. Yet when we analyse just the commencement of this lovely promenade, we find it to contain as follows:—

Left Bank.

1. *Robinia Pseudacacia;* the common Bastard Acacia. A Papilionaceous tree; native of North America. Introduced 1640.
2. *Euonymus japonicus;* the variegated Spindle-tree. A Celastrineous shrub; native of Japan. Introduced 1836.
3. *Æsculus Hippocastanum;* the common Horse-chestnut. A Hippocastaneous tree; native of Asia. Introduced 1629.
4. *Spiræa corymbosa;* the Corymbose Spiræa. A Spiræaceous shrub; native of North America. Introduced 1819.
5. *Spiræa lævigata;* the smooth-leaved Spiræa. A Spiræaceous shrub; native of Siberia. Introduced 1774.
6. *Pyrus latifolia;* the broad-leaved white Beam Tree. A Pomaceous tree; native of Denmark. Introduced 1789.
7. *Quercus austriaca;* the Austrian Oak. A Cupuliferous tree; native of Austria. Introduced 1824.
8. *Quercus Suber;* the Cork-tree. A Cupuliferous tree; native of the South of France. Introduced 1699.
9. *Ilex balearica;* the Minorca Holly. An Aquifoliaceous tree; native of Minorca. Introduced 1815.
10. *Aucuba japonica;* the blotch-leaved Aucuba. A Cornaceous shrub; native of Japan. Introduced 1783.
11. *Cydonia japonica;* the Japan Quince. A Pomaceous shrub; native of Japan. Introduced 1815.
12. *Celtis Tourneforti;* Tournefort's Nettle-tree. An Ulmaceous shrub; native of the Levant. Introduced 1739.

Right Bank.

1. *Philadelphus Zeyheri;* Zeyher's Syringa. A Philadelpheous shrub; native of North America.
2. *Deutzia scabra;* the rough-leaved Deutzia. A Philadelpheous shrub; native of Japan. Introduced 1833.
3. *Liriodendron Tulipifera;* the common Tulip-tree. A Magnoliaceous tree; native of North America. Introduced 1663.
4. *Spiræa sorbifolia;* the sorbus-leaved Spiræa. A Spiræaceous shrub; native of Siberia. Introduced 1759.
5. *Betula lenta;* the Pliant Birch. A Betulineous tree; native of North America. Introduced 1759.
6. *Amelanchier Botryapium;* the Grape Pear. A Pomaceous tree; native of North America. Introduced 1746.
7. *Syringa persica;* the Persian Lilac. An Oleaceous shrub; native of Persia. Introduced 1640. (A fine specimen.)
8. *Thuja pendula;* the pendulous branched Arbor Vitæ. A Coniferous tree; native of Tartary. Introduced 1838.
9. *Cratægus Aronia;* the Aronia. A Pomaceous tree; native of the South of Europe. Introduced 1810.
10. *Calycanthus floridus;* the florid Allspice. A Calycanthaceous shrub; native of Carolina. Introduced 1726.
11. *Quercus petiolaris;* the long-petioled Mexican Oak. A Cupuliferous tree; native of Mexico. Introduced 1839.
12. *Quercus coccinea;* the Scarlet Oak. A Cupuliferous tree, so well painted by the American artist, Mr. Cropsey. The tree should be seen in autumn. Introduced 1691.

Now, were we to deduct from this promenade, (from end to end) merely its acclimatized attractions, we should leave it about as interesting as one of the streets of Hull.

are or may be hereafter newly-introduced into France, and may seem worthy of interest from their usefulness or ornament."

For France, read Europe, and then we shall clearly understand the scheme. In the remarks about to follow, I have been painfully hampered by the difficulty of compressing discursive details into journal space; the whole zoological section has been necessarily omitted; while at the same time many of the topics here barely mentioned form the basis of successive lengthy papers in the official Transactions of the Society. Enough however is brought forward to guide the steps of future students, and possibly to stimulate their interest; and if all the hidden gold has not been dug up ready for the market, at least a good plain sign-post has been erected to indicate the mine.

The Society of the Garden of Acclimatization is thus constituted. Its duration is restricted to forty-two years. Capital a million francs (£40,000), in 4000 shares, of 250 francs (£10) each. Each share gives a right to an equal and proportional allotment of effects, and constitutes a perpetual free ticket of admission. Part of the capital is to be so invested as that at the end of forty-two years the shareholders shall receive back the amount of their original contribution.

Previous to the actual establishment of the Garden, the committee visited and studied the gardens (Zoological and Botanical) of London, Brussels, Antwerp, Ghent, Amsterdam, and Marseilles. The nature of the receipts is two-fold:—1st. The sale of animals, eggs, plants, and seeds; 2nd. the payment of visitors. The Council consists of forty members, each of whom must have not less than five shares. After payment of necessary expenses, a reserve fund is created of 150,000 francs (£6000); the surplus beyond this is thus divided:—five per cent. on shares at interest; five per cent as a sinking fund; and of the remainder, half is to be given to the shareholders as dividend, and half to the City of Paris as indemnity. Whilst we are on business topics, I may add that the Imperial Society took a hundred shares, the banker is M. Rothschild, and the office of the Garden is at present No. 19, Rue de Lille, Paris.

The Garden is situated in the Bois de Boulogne, just beyond the fashionable promenade; a broad pathway runs right round it. The first building that strikes the eye is the establishment for silkworms, where, from May to October, are made the various experiments on the cultivation and introduction of silk. By the side of the different silkworms feeding on the mulberry, from France, Italy, Spain, Asia Minor, India, China, and Japan, are seen the new species that have been introduced into Europe by means of the Society,—namely, the *Bombyx Mylitta* (silkworm feeding on the Oak), *Bombyx Arrindia* (silkworm of the castor-oil plant), and the celebrated *Ailanthus* (Vers à soie de l'Ailante), the *Bombyx Cynthia vera*, about which so much has been written, and from which so much is expected.

Next in order comes the great collection of birds,—not the mere gathering of a Zoological garden, but the specimens only of such as are recommended either by their beauty or their use. Behind this building are two rows of cages; one used as a sort of waiting-room when regular accommodation is deficient, the other arranged as a hospital for sick birds. I must not stop to mention the curious fowl-yard, the pride of the genuine acclimatist, but I may just remind the reader that the most useful fowl we have in England is due to the prescient acclimatist who first introduced to Europe the domestic cock and hen.

Further on, we find the space reserved for the annual exhibitions; and continuing our route, the paddocks of the larger animals, such as the yaks, oxen, sheep, and goats, every specimen of which is there to work out the problem indicated by the donor. Coming back, the beehives meet our view. In the summer, lessons are regularly given upon bee-training and cultivation, properly called Apiculture.

The aquarium is now no novelty; the one here presented is wonderful in its details and arrangement. We are apt (led by experience) to consider an aquarium as a repository of weird-looking shapes, which we were content to know mostly resided at the bottom of the sea, and we were sometimes tempted to consider their abode appropriate: certain it is that scientific children have done their utmost to bring this useful institution into pardonable disgust. Here however, the salmon, trout, carp, and eel may be studied in a tolerably correct imitation of their actual homes; whilst in another compartment sundry sea-water groups, and in regular succession of time, the eight thousand species which constitute the class called fish may be carefully examined. This alone may give some idea upon what a scale this practical scheme of education has been devised.

Leaving the aquarium, we gain perhaps the most interesting spot in the whole Garden, the "Garden of Experiment," where the different plants, grains, and seeds that have been received from time to time by the Society are in process of cultivation, and on which should be inscribed the motto, "failures constitute success." Such of our members who are so nervously timid about the establishment on their own premises of a museum of practical experiment and apparatus, would do well to witness the rapid progress lately made in applied Zoology and Botany in the field-laboratory of the Garden of Acclimatization, a progress that will not be slow in bearing a direct influence on Pharmacy itself.

Here are presented, under different modes of cultivation, and flourishing with every imaginable variation of success, more than four hundred species of plants, destined to serve for food, for medicinal purposes, or else capable of industrial application. Some of these deserve a special notice.

1. Chinese Yam, or L'Igname Patate (*Dioscorea Batatas*). In 1846 Vice-Admiral Cécille brought home from his Indian voyage an elongated tuber, which he put into the hands of M. de Mirbel, Professor at the Museum of Natural History. This tuber in time produced a plant, which was preserved up to 1850 without having offered any remarkable character. But in April of the same year, M. C. de Montigny sent over from Shanghai a certain number of root-like tubercles, to the Minister of Agriculture and Commerce, with the statement that they were held in much estimation in China. Many of the specimens were forwarded to the Museum of Natural History, and although exhibited under the most unfavourable circumstances, they still succeeded in their cultivation. After considerable discussion, they were shown by M. Decaisne to belong to a new species, which he termed Igname Patate (*Dioscorea Batatas*). The same gentleman demonstrated their identity with the samples already forwarded by the Vice-Admiral. Convinced of the advantage to be reaped from the new tuber, M. C. de Montigny dispatched a considerable supply to the Imperial Society, and, in 1855, shipped a large consignment for gratuitous distribution. The part used is a rhizome or underground stem, not a root. The technical botanical description of the plant will scarcely interest the reader; if desired, it can readily be obtained from any recent manual; the official French report is drawn up by M. A. Moquin-Tandon.

The best idea of its actual constituents will be gathered from the triple analysis subjoined:

	Payen.	Boussingault.	Frémy.
Roots collected at	Algiers.	Paris.	Paris.
Starch	16·76	13·10	16·00
Nitrogenous substance	2·55	2·40	1·50
Fatty matter	0·30	0·20	1·10
Cellulose	1·45	0·40	1·
Mineral salts	1·99	1·30	1·10
Water	76·95	82·60	79·30
	100·00	100·00	100·00

The Igname is easily reproduced from slices of root, slips, bulbs, or seeds. The first success obtained in its cultivation was due to M. Pépin, head-gardener at the Museum; whilst M. Paillet undertook its production on an extensive scale, and with such good result, that in 1854 he could show several thousand samples.

Others soon followed the example, and the Chinese Yam bids fair to become a national acquisition. Few vegetables have met with such a rapid introduction, though voices were not wanting to vote it a delusion; on the other hand, no vegetable ever met with either so much neglect or such obstinate opposition as the one the Yam is destined in some degree to supplement—the common potato. Finding the utter indifference of the populace with respect to its merits, Parmentier obtained a guard of soldiers to watch by day over the potato plantations; late at night the troops were withdrawn, when the public were judiciously allowed to steal what otherwise they had treated with contempt, an actual illustration of the line,—

"Do good by stealth, and blush to find it fame."

Until the adoption of this pious fraud, the introduction of the new esculent was considered hopeless. The Igname has one fault: its roots are too long, and they bury themselves vertically in the ground, causing a great difficulty in their extraction. Time and experiment may overcome the failing, for a defect it is; surely if George Stephenson the engineer grew his cucumbers straight, the scientific gardener need not despair in producing the tubers of the Igname short. The Igname is a real acquisition. Tasted when uncooked it is not disagreeable, and resembles the hazel-nut; when cooked, it is unctuous, mellow, succulent, and somewhat luscious. It has the merit of being neither bitter nor sweet, though sweetness is not held as a disqualification on the Continent. It contains sixteen per cent. of starch, the potato containing twenty per cent. The Igname, which can be rapidly propagated, and therefore offered to the public on the most reasonable terms, is not meant to supplant, but to supplement, the potato; its general applications are the same, and we have already seen in the records of a disastrous famine the crisis to be feared when a nation's sustenance hangs upon the healthy vigour of one single tuber.

2. Chinese Sugar-cane,—Sorgho sucré, *Holcus saccharatus*,—from the north of China, an annual introduced, in 1850, by M. C. de Montigny. A most graceful and elegant plant; at first of slow growth, but from the month of July its condition is entirely changed, and it soon presents a luxuriant development. Its seeds are ripe towards the end of summer. The leaves are withered by the first frost, but its stems keep their green colour, at least to some extent, up to the months of December and January.

Analysis.	(M. Itier.)
Sugar	8·210
Starch	0·100
Woody fibre (cellulose)	17·775
Silica	0·065
Various salts	0·520
Water	73·330
	100·000

The sugar-cane contains almost the same quantity of water, but exhibits on analysis eighteen per cent. of sugar. The sorgho is used for various purposes. As fodder for cattle, it yields several crops a year, forming an excellent food, only it ought not to be cut too young. Its stalks give a fermented drink like beer, the taste of which is very agreeable. It yields moreover

sugar and alcohol; and lastly, in the south of France, where the seeds arrive at perfect maturity, they furnish an abundant product, which serves to fatten poultry and pigs. It has been determined by experiment that the cane yields from fifty to sixty per cent. of sugar-juice, which juice yields from ten to twenty per cent. of sugar, at first supposed to be uncrystallizable, but from which crystals were subsequently produced.

By the distillation of the fermented juice, five per cent. of absolute alcohol is drawn over. If we compare these results with beetroot, we shall find that this latter produces eight to ten per cent. of sugar, and that while beetroot juice gives three to four per cent. of alcohol, which is not fit for wine, the juice of the sorgho yields from six to ten per cent. of excellent alcohol, fit for all industrial and economic purposes.

3. *Chenopodium Quinoa*, from the Cordilleras. An annual. The leaves are eaten like spinach; the seeds produce a farina, of which soups are made as well as cakes, which have a very agreeable taste, and are easy of digestion. A sort of beer is obtained from the seeds by fermentation. The Chenopodium also affords an excellent food for poultry, while the whole plant is a good fodder for cows. In Peru, and on the level plain of the Cordilleras, this plant is one of their most valuable possessions, inasmuch as the country is devoid of cereals. In 1862 a variety of the plant was received from Peru, which seemed decidedly superior. Its immediate cultivation is about to be actively undertaken.

4. *Hibiscus esculentus.* An annual, from South America. The unripe capsules, or young fruits, are made into a stew,—a dish held in much estimation by the Creoles. In the south of France its seeds are used as a substitute for coffee.

5. *Solanum tuberosum.* A fair number of tubers have been received from their original home, the Cordilleras of the Andes. Many of the smaller ones have much improved by culture during the second year; not one has as yet been affected by disease. The number of varieties is fifteen, and the next gathering will allow the choice of a better selection for replanting.

6. *Convolvulus Batatas*, from Japan. *Convolvulaceæ.* Sweet Potato. [Stem creeping widely; leaves cordate, acute, angular, stalked; peduncles longer than the petiole; 3–4 flowered; sepals mucronate; corolla large, purple; root very large, tuberous. Habitat—East Indies; cultivated in all tropical countries. Quality—sweet, nutritive, laxative. Uses—the tubers are largely consumed for food in all hot countries, where they occupy the place of potatoes with us.—*Lindley.*]

This new species is of a yellowish-white and elongated form. It is so sugary that little can be eaten at a time. Great hopes are entertained that it will be found extremely useful in the production of sugar. (I may add that, though occasionally recommended as a vegetable, its taste is sweet beyond endurance.)

7. *Tetragonia expansa*, from New Zealand. [New Zealand spinach. A trailing succulent: annual; leaves stalked, ovate, rhomboid; fruit 4-horned, 6–8-seeded. Habitat—New Zealand. Quality and uses—cultivated in gardens for its mucilaginous, insipid, succulent foliage; used instead of spinach.—*Lindley.*] Leaves and young shoots are eaten like spinach, to which they are said to be quite equal in taste. The plant is antiscorbutic. It is of very rapid growth, especially in hot, dry weather, particularly during the months of July, August, and September. It should be potted under cover towards the end of April, and transplanted when tolerably advanced. Its growth is most abundant.

(To be continued.)

QUININE FROM CINCHONAS GROWN IN INDIA.

Our readers will learn with much interest that quinine and cinchonine have already been extracted from the bark of cinchona-trees cultivated in India. A short time since Mr. M'Ivor, the superintendent of the cinchona plantations in India, forwarded to this country a box containing specimens of cinchona bark of two years' growth, etc., from the Neilgherry Hills. These samples were transmitted to Mr. Howard for analysis, who obtained from them crystallizations of very white sulphate of quinine, as also some cinchonine, and sulphate of cinchonidine. This must be regarded as a most satisfactory result, and more especially so, as, according to Mr. Howard, the amount of alkaloids thus obtained appears to him to be quite as great as would be yielded by the bark of South American cinchonas of the same age.

THE ELEMENTS OF THE METRIC SYSTEM.

The metric system consists of four principal measures—the *metre* (unit of length), the *are* (unit of land measure), the *litre*, unit of capacity, and the *gramme* (unit of weight). The three last are derived from the metre thus:—The are is the surface of a square whose side is equal to ten metres; the litre is the capacity of a cube whose edge is the tenth part of a metre; and the gramme is the weight of a cube of pure water, at maximum density, whose edge is the hundredth part of a metre.

The subdivisions and multiples of these elements are formed digitally, as in the ordinary principles of arithmetic numeration. Each of the following denominations is equal to one-tenth of the preceding one in the same series, the prefixes being of Latin derivation for the subdivisions, and of Greek origin for the multiples.

For measures of length:—The millimetre (1000th of a metre), centimetre (100th), decimetre (10th), metre (unit), decametre (10 times), hectometre (100 times), kilometre (1000 times), and myriametre (10,000 times).

For land measure:—The centiare, deciare, are, decare, hectare.

For capacity:—The millilitre, centilitre, decilitre, litre, decalitre, hectolitre, and kilolitre.

For weights:—The milligramme, centigramme, decigramme, gramme, decagramme, hectogramme, kilogramme, myriagramme, quintal, and ton, or millier. All these divisions are capable of being used as secondary units.

The metre is the ten-millionth part of the distance of the pole of the earth from the equator, measured on a great circle, and is equivalent to 39·37079 inches English, or 1·094 yard. A millimetre = 0·039 inch; centimetre = 0·394 inch; decimetre = 3·937 inches; decametre = 32·809 feet = 10·936 yards; kilometre = 1093·633 yards = 4·971 furlongs = 0·621 mile; myriametre = 49·710 furlongs = 6·214 miles.

The are, or square of the decametre (100 square metres), is = 119·603 square yards = 3·954 perches. The centiare, or square metre, = 1·196 square yards; the deciare = 11·96 square yards; the decare = 1196·033 square yards = 39·538 perches; the hectare = 395·383 perches = 2·471 acres.

For liquid measure:—The centilitre = 0·018 pint; decilitre = 0·176 pint; litre = 1·761 pint; decalitre = 8·804 quarts; hectolitre = 22·010 gallons = 2·751 bushels for dry measure; kilolitre = 27·512 bushels = 220·097 gallons.

For weights:—The gramme = weight of a cubic centimetre of pure water = 15·432 troy grains; the milligramme = 0·015 grain; centigramme = 0·154 grain; decigramme = 1·543 grain; decagramme = 5·644 avoirdupois drachms; hectogramme = 3·527 avoirdupois ounces; kilogramme = 2·205 avoirdupois

TABLE OF THE MINOR MEASURES OF CAPACITY, AND OF MINOR WEIGHTS, OF THE METRIC SYSTEM,

COMPILED FOR THE PHARMACEUTICAL JOURNAL, BY CHARLES HUTTON DOWLING, C.E.

Measures of Capacity.

Metric Denominations.	Proportion of Parts.	British Imperial Equivalents. Pints.	Fluid Ounces.	Fluid Drachms.	Minims.	Imperial Equivalents in each Denomination. Minims.	Drachms.	Ounces.	Pints.
Half Decimillilitre	·00005				·8	0·845			
Decimillilitre*	·0001				1·7	1·690			
Double Decimillilitre	·0002				3·4	3·381			
Half Millilitre	·0005				8·5	8·452			
Millilitre	·001				16·9	16·903			
Double Millilitre	·002				33·8	33·807			
Half Centilitre	·005			1	24·5	84·517 =	1·409		
Centilitre	·01			2	49·0	169·034 =	2·817		
Double Centilitre	·02			5	38·1	338·068 =	5·634		
Half Decilitre	·05		1	6	5·2	845·171 =	14·086 =	1·761	
Decilitre	·1		3	4	10·3	1690·342 =	28·172 =	3·521	
Double Decilitre	·2		7	0	20·7	3380·685 =	56·345 =	7·043	
Half Litre	·5		17	4	51·7	8451·712 =	140.862 =	17·608 =	0·880
Litre	1·	1	15	1	43·4	16903·425 =	281·724 =	35·215 =	1·761

Weights. Equivalents in Apothecaries' Weight.

Metric Denominations.	Proportion of Parts.	Troy Pounds.	Ounces.	Drachms.	Scruples.	Grains.	Grains.	Scruples.	Drachms.	Ounces.	Pounds.
Milligramme	·001					0·01	0·015				
Centigramme	·01					0·1	0·154				
Half Decigramme	·05					0·8	0·772				
Decigramme	·1					1·5	1·543				
Double Decigramme	·2					3·1	3·086				
Half Gramme	·5					7·7	7·716				
Gramme	1·					15·4	15·432				
Double Gramme	2·				1	10·9	30·865 =	1·543			
Half Decagramme	5·			1	0	17·2	77·162 =	3·858 =	1·286		
Decagramme	10·			2	1	14·3	154·323 =	7·716 =	2·572		
Double Decagramme	20·			5	0	8·6	308·647 =	15·432 =	5·144		
Half Hectogramme	50·		1	4	2	11·6	771·617 =	38·581 =	12·860 =	1·607	
Hectogramme	100·		3	1	2	3·2	1543·235 =	77·162 =	25·721 =	3·215	
Double Hectogramme	200·		6	3	1	6·5	3086·470 =	154·323 =	51·441 =	6·430 =	0·536
Half Kilogramme	500·	1	4	0	1	16·2	7716·174 =	385·809 =	128·603 =	16·075 =	1·340
Kilogramme	1000·	2	8	1	0	12·3	15432·349 =	771·617 =	257·206 =	32·151 =	2·679

* A short technical name for this small measure might be found.

pounds; myriagramme = 22·046 avoirdupois pounds; quintal = 1·968 cwt.; ton = 19·684 cwts.

The equivalent of the standard imperial measures with the metric system are as follows:—An inch is equivalent to 25·399 millimetres, therefore a millimetre is about $\frac{1}{25}$ of an inch; a foot = 3·048 decimetres, or a little over 30 centimetres; a yard = 0·914 metre, or about $\frac{9}{10}$ metre; a pole = 5·029 metres; a surveying-chain = 20·116 metres, differing little from the metric chain of 20 metres; a mile = 1609·315 metres; a square perch = 25·292 square metres, a little more than a quarter of an are, or 100 square metres; a rood = 10·117 ares, corresponding nearly with the decare, which is 10 ares; an acre = 0·405 hectare, or 5 acres would = 2 hectares; a pint = 0·568 litre; a quart = 1·136 litre, or a little more than $\frac{1}{10}$th over; gallon (imperial) = 4·543 litres; sack = 1·090 hectolitre; quarter = 2·908 hectolitres. Troy grain = 0·065 gramme; apothecaries' scruple = 1·296 grammes; apothecaries' drachm = 3·888 grammes; troy or apothecaries' ounce = 31·103 grammes; a troy pound = 373·242 grammes = 0·373 kilogramme; avoirdupois drachm = 1·772 gramme; avoirdupois ounce = 28·349 grammes; avoirdupois pound = 453·593 grammes = 0·454 kilogramme.

Subjoined is a table of minor measures of capacity and of minor weights for medical use.

PROPOSED DECIMAL SYSTEM OF PHARMACEUTICAL WEIGHTS.

Any one who has used the decimal system of weights and measures employed by our French neighbours, can scarcely have failed to be charmed with its extreme simplicity and the facility with which it may be learned and retained. On the other hand, who that has puzzled over the almost hopeless confusion of our own system, and desponded at the difficulty with which it is drilled into our unwilling brains, and the too great ease with which it is forgotten, can have helped indulging a wish that we might some day borrow our weights, like our plays, "from the French"?

The one great objection to adopting the French system *in toto* is, that none of the weights now in use can be expressed in grammes without resorting to fractions, and the confusion would thus only be rendered worse confounded. I have therefore endeavoured, as a step in the right direction, to turn some of our weights and measures—those, at least, used in pharmacy—into a decimal system, imperfect, it is true, but one which has the advantage of expressing all the existing weights, with but two exceptions, in whole numbers.

I cannot help thinking that if some such system could be introduced into the forthcoming edition of the Pharmacopœia, a great boon would be conferred on us all, as none would have any difficulty in translating the old weights into the new, and one great cause of confusion, the difference between the troy and avoirdupois weights, and also between the solid and fluid ounce, would be abolished.

I propose, then, to adopt, as the unit of weight, the present scruple of twenty grains, which I would call a "mona;" then, using the Latin and Greek prefixes to express the divisions and multiples respectively, as in the French system, the table would be as follows:—

1·00, the mona	20 grains.
·05, or 5 centimonas	1 grain.
·10, or 1 decimona	2 grains.
3·00, 3 monas	1 drachm.
24·00	1 oz. troy.
288·00	1 lb. do.
21·875	1 oz. avoirdupois.

350·00	1 lb. avoirdupois.
39,200·00	1 cwt.
784,000·00, or 784 kilomonas	1 ton.
21·875 monas	1 fluid oz. of distilled water.
437·50	1 pint do.
3,500·00	1 gallon.

It is thus seen that every weight now used (in medicine) is expressed in whole numbers, with the exception of the ounce avoirdupois, or fluid ounce, and the pint. I would therefore discard these, and have a new weight in place of the ounce avoirdupois, to be called a "dime," which should be the tenth part of a pound, and would equal 1⅗ ounces; consequently 5 dimes would equal 8 ounces, 10, or a decadime, would equal a pint, *old measure*, or a pound of distilled water; and ten of these again, or the hectodime, would equal a gallon. Thus,

35·00 monas	1 dime, 1⅗ oz.
350·00 „	16 fluid oz. of distilled water.
3,500·00 „	hectodime or gallon.

W. L. SHEPARD.

202, *Gray's Inn Road, June 19th*, 1863.

THE PROVINCIAL EXAMINATIONS.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—The above subject, which is now before the notice of the Pharmaceutical Society, is one which ought to command the serious consideration of all its members who wish to extend its borders, and multiply its numbers; because, if it was generally adopted, it would be beneficial to the Society and to many of those not now members: to the Society by increasing its numbers, thereby gaining for it more wide-spread reputation and greater influence before the eyes of the public; to those not now members, who stand aloof from the Society on account of various reasons, as the loss of time incurred by a journey to London, the expense and trouble, coupled with the uncertainty of ultimately gaining their desired object. For instance, how many, engaged in business on their own account, could leave for the journey to London and back, and staying there, just for the purpose of passing the examination, which is their desire. Could it be done more advantageously to themselves, who would not eagerly embrace the opportunity, if presented in their own town, or the provincial town for the county in which they reside?

Could not examiners be found in the different towns, who would be able to undertake this task, efficiently and correctly, so that the candidates could pass an examination similar to the present major?

As this matter is now brought under notice, let us hope it will not be discarded as useless and unprofitable, until it has been subjected to judicious meditation, upon the benefit arising to both parties, and the necessity of adopting this useful proposition.

Yours truly, A READER.

Leicester, June 4th, 1863.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—I hope that such a valuable suggestion as is given to the Pharmaceutical Society in this month's Journal by "Opifex," will not be permitted to fall to the ground as worthless.

I am sure that the Society would be supplying *a long-felt want* by establishing these Provincial Examinations.

In our trade money cannot be obtained without working for it, and many young men will not go to a heavy expense to pass the examinations in London, when the advantages they derive from connection with the Society are so few. It is true they have the Journal, but they pay a subscription for it, and often find *too little in its pages to interest them;* besides, in the country, many of those who have not passed the examinations obtain as good a situation as those who have, by examination, proved their knowledge of the Chemist's and Druggist's requirements.

The Pharmaceutical Society will lose much of that *sympathy which it ought to have* from those connected with it if it does not adapt itself to their wants.

On looking back, I find there are five hundred and thirty registered apprentices of the Pharmaceutical Society; of these, *more than two hundred and twenty* have been connected with it for more than five years (the period of apprenticeship); they have not gone further, and are to a certain extent lost to the Society; their parents or master had them registered as Apprentices (by passing an examination at home), and for *the want of a little impetus* they have not associated themselves with the Society as Minors or Majors, and most of them are in situations as *Assistants;* proving by their influence a drag to the exertions of their juniors, who are too apt to imitate their example, and leave their names still on the list as Apprentices instead of passing an examination, which, by a little exertion, they ought to be able to do if their Master has fulfilled his contract with them; that is, if he has *taught them their trade, and not a part of it only.*

Chemistry has advanced with the age,—indeed, no science has advanced to a greater extent (especially in the organic department) during the last few years, and the Pharmaceutical Society has steadily gained ground; but we must not now sit down in a state of lethargy when a little exertion on the part of a few would increase the numbers threefold. I know many who, if the examination were brought home to them, would present themselves before the *Provincial Board* and pass, and do so creditably, and thus aid us in a pecuniary, personal, and scientific sense, and after passing the Minor at the Provincial Board, they would take their Major Diploma in London.

From the statistics before given, two-fifths of youthful effort has been *stifled, snuffed out;* surely we may suppose this has had a *deadening effect* on the others. Let us place more allurements in the manner "Opifex" proposes, to induce young men to pass the examinations, and there will not then be this falling off.

If the Society will think over these suggestions, and place them in a practical form before us, we will present ourselves for examination at these provincial boards, and hope soon, when *our time* comes, to equal, yea, surpass, those before us having had superior advantages.

I am, yours faithfully,
A REGISTERED APPRENTICE.

Bristol, May 12th, 1863.

PHARMACEUTICAL ANNIVERSARY.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—One more month, or thereabout, and the Pharmaceutical Society of Great Britain will have completed its twentieth year since incorporation. What it has done, how it has progressed from its infancy to its present state, and what it is now doing, are questions too well known by the general body of its members to need reiteration. At all events, they have very little room for dissatisfaction. It is thought, perhaps, that were a little younger blood infused into its Council it would (with the experience of its older members) be beneficial to the Society. The question has been mooted several times about our having an annual dinner,

and I suppose the Pharmaceutical Society is almost the only body which does not celebrate its anniversaries in that manner. This present season is one teeming with happy events and joyful gatherings; bodies corporate, municipal, scientific, and others, have each had their banquets, dinners, etc., according to their position; and why should not the Pharmaceutists have an opportunity of expressing their loyalty and unanimity? Besides, it would be of positive advantage to the Society itself. The social board is one over which Englishmen love to gather, and how many new members would not rally round, and throw influence and zeal into our undertaking. It would also add to the funds of the benevolent branch of the Society, which is so much needed, and which appears to have so much difficulty in keeping up subscriptions, from the lists which appear occasionally in the Journal.

I am but a young member of the Society, but I hope that this revival of the old question may find a response from many, and though imperfectly expressed and put forth, is not less meant in good faith and sincerity, and for the future prosperity and welfare of our Society.

I remain, yours faithfully,
FREDERICK TIBBS.

47, *Blackfriars Road, London, May 19th*, 1863.

COCHINEAL IN ASIA MINOR.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—In the neighbourhood of *Oushak*, in Asia Minor, there occur immense quantities of an insect, producing, when bruised, the usual cochineal colour, and resembling in every respect the insects of the *Cactus cochinillifer* of Mexico, except that they are covered with a long downy kind of hair. When dry, the hairs may easily be removed by gentle friction. These insects feed on a species of *Cistus*, the *Cistus laurifolius* of Boissier and Balansa, a small shrub with which the district abounds.

Perhaps some of your correspondents can inform us whether any of this cochineal comes into the English market, or has attracted the attention of naturalists.

Yours, &c., FRED. PERTWEE.

British Hospital, Smyrna, May 21, 1863.

PROPOSED AMENDMENTS TO THE MEDICAL ACT OF 1858.

At a meeting of the General Council of Medical Education and Registration, held on the 1st of June, Dr. Corrigan presented the Report of the Committee on Amendments of the Medical Act. It states that,

"The course the Committee have adopted is to go through the sections of the Medical Act seriatim, and to append to each section such proposed amendments as seemed fit to be submitted for consideration.

"The Committee do not propose that the General Council should at present express an opinion on the proposed amendments, nor are the Committee unanimous in some of the amendments suggested.

"The Committee suggest that the present course might properly be, that the General Council, without expressing an opinion on the proposed amendments, should give instructions to the Executive Council to have a Bill drawn up, embodying the proposed amendments; that the Bill thus drawn up should be transmitted to the several Licensing Bodies mentioned in Schedule (A) for their consideration, and that the amended Bill, with any alterations suggested by the several Licensing Bodies, should be submitted for consideration at the next annual meeting of the General Council."

ORIGINAL ACT. | PROPOSED AMENDMENTS.

TITLE.

An Act to regulate the Qualifications of Practitioners in Medicine and Surgery.

A Bill to amend the Medical Acts.

PREAMBLE.

Whereas it is expedient that persons requiring medical aid should be enabled to distinguish qualified from unqualified practitioners: be it therefore enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords spiritual and temporal, and Commons, in the present Parliament assembled, and by the authority of the same as follows:—

Whereas it is expedient that persons requiring medical aid should be enabled to distinguish qualified from unqualified practitioners; and whereas it is moreover necessary for the safety and protection of the public towards securing adequately educated practitioners in the several departments of Medicine, Surgery, and Pharmacy: be it therefore enacted, etc. etc.

SECTIONS.

X. The General Council shall appoint a registrar, who shall act as secretary of the General Council, and who may also act as treasurer, unless the Council shall appoint another person or other persons as treasurer or treasurers; and the person or persons so appointed shall likewise act as registrar for *England*, and as secretary and treasurer or treasurers, as the case may be, for the Branch Council for *England;* the General Council and Branch Council for *England* shall also appoint so many clerks and servants as shall be necessary for the purposes of this Act; and every person so appointed by any Council shall be removable at the pleasure of that Council, and shall be paid such salary as the Council by which he was appointed shall think fit.

FOR SECT. X.—Substitute the following:—

The General Council shall appoint a registrar, who shall act as secretary of the General Council, and may act as treasurer, unless the Council shall appoint another person or other persons as treasurer or treasurers. The General Council shall also appoint so many clerks and servants as shall be necessary for the purposes of this Act; and every person so appointed shall be removable at the pleasure of the Council, and shall be paid such salary as the Council shall think fit.

XIII. All moneys payable to the respective Councils shall be paid to the treasurers of such Councils respectively, and shall be applied to defray the expenses of carrying this Act into execution in manner following; that is to say, separate accounts shall be kept of the expenses of the General Council, and of those of the Branch Councils; and the expenses of the General Council, including those of keeping, printing, and publishing the Register for the United Kingdom, shall be defrayed, under the direction of the General Council, by means of an equal percentage rate upon all moneys received by the several Branch Councils; returns shall be made by the treasurers of the respective Branch Councils, at such times as the General Council shall direct, of all moneys received by them; and the necessary per-centage having been computed by the General Council, the respective contributions shall be paid by the treasurers of such Branch Councils to the treasurer or treasurers of

CLAUSE XIII. and proposed Amendments, with Observations of Scotch Branch Council of No. 27, 7th Feb., 1863, to be referred back to solicitor for observations.

For SECT. XIII.—Substitute a section to the following effect:—

Separate accounts shall be kept of the expenses of the General Council, and those of the Branch Councils. The expenses of the Branch Councils shall be defrayed under the direction of those Councils, respectively, out of the moneys received by them. Returns shall be annually made by the treasurers of the respective Branch Councils of all moneys so received and expended by them; and the said treasurers shall, as soon as possible, transmit the balance remaining in their hands to the treasurer of the General Council; and the expenses of the General Council, including those of keeping, printing, and publishing the Register of the United Kingdom, shall be defrayed, under direction of the General Council, out of the fund arising from the

the General Council; and the expenses of the Branch Councils shall be defrayed, under the direction of those Councils respectively, out of the residue of the moneys so received as aforesaid.

XIV. It shall be the duty of the registrars to keep their respective registers correct in accordance with the provisions of this Act, and the orders and regulations of the General Council, and to erase the names of all registered persons who shall have died, and shall from time to time make the necessary alterations in the addresses or qualifications of the persons registered under this Act; and to enable the respective registrars duly to fulfil the duties imposed upon them, it shall be lawful for the registrar to write a letter to any registered person, addressed to him according to his address on the register, to inquire whether he has ceased to practise, or has changed his residence; and if no answer shall be returned to such letter, within the period of six months from the sending of the letter, it shall be lawful to erase the name of such person from the register; provided always, that the same may be restored by direction of the General Council, should they think fit to make an order to that effect.

XX. In case it appear to the General Council that the course of study and examinations to be gone through in order to obtain any such qualification from any such college or body are not such as to secure the possession by persons obtaining such qualification of the requisite knowledge and skill for the efficient practice of their profession, it shall be lawful for such General Council to represent the same to Her Majesty's most Honourable Privy Council.

XXI. It shall be lawful for the Privy Council, upon any such representation as aforesaid, if it see fit, to order that any qualification granted by such college or body, after such time as may be mentioned in the order, shall not confer any right to be registered under this Act: provided always, that it shall be lawful for Her Majesty, with the advice of Her Privy Council, when it is made to appear to her, upon further representation from the General Council or otherwise, that such college or body has made effectual provision, to the satisfaction of such General Council, for the improvement of such course of study

contributions of the Branch Councils, as well as from all other sources, to be called the General Council Fund.

Sect. XIV.—Insert the following after the words "his residence":—

And if any person registered shall notify to the registrar that he has ceased to practise, and wishes to withdraw his name from the register, the registrar shall have power to erase his name.

For Sect. XX.—Substitute a section to the following effect:—

It shall be lawful for the General Council to lay down such regulations respecting the education and examination of practitioners in medicine, surgery, and pharmacy, as may appear to them fitted to ensure adequate knowledge and skill in the several departments of the profession; and the said General Council shall then submit said regulations to Her Majesty's most Honourable Privy Council. And the said regulations, if sanctioned by the said Privy Council, shall then be obligatory upon all universities, colleges, and other bodies enumerated in Schedule (A) to this Act.

For Sect. XXI.—Substitute the following:—

And it shall be lawful for the Privy Council, upon its being represented to them, that any university, college, or other body enumerated in Schedule (A) does not comply with such regulations, to declare that any qualification granted by such university, college, or body, shall not confer any right to be registered under this Act. Provided always, etc.

or examinations, or the mode of conducting such examinations, to revoke any such order.

XXVII. The Registrar of the General Council shall in every year cause to be printed, published, and sold, under the direction of such Council, a correct Register of the names in alphabetical order according to the surnames, with the respective residences, in the form set forth in Schedule (D) to this Act, or to the like effect, and medical titles, diplomas, and qualifications conferred by any Corporation or University, or by Doctorate of the Archbishop of *Canterbury*, with the dates thereof, of all persons appearing on the General Register as existing on first day of *January* in every year; and such register shall be called 'The Medical Register;' and a copy of the 'Medical Register' for the time being, purporting to be so printed and published as aforesaid, shall be evidence in all Courts and before all Justices of the Peace and others that the persons therein specified are registered according to the provisions of this Act; and the absence of the name of any person from such copy shall be evidence, until the contrary be made to appear, that such person is not registered according to the provisions of this Act: provided always, that in the case of any person whose name does not appear in such copy, a certified copy, under the hand of the Registrar of the General Council, or of any Branch Council, of the entry of the name of such person on the General or Local Register, shall be evidence that such person is registered under the provisions of this Act.

To Sect. XXVII.—After the words "Provisions of this Act," add the words as proposed in the *Tabular Statement*, viz.:—

"And that he is not possessed of any qualification which would entitle him to be registered in accordance with the provisions of this Act."

XXIX. If any registered medical practitioner shall be convicted in *England* or *Ireland* of any felony or misdemeanour, or in *Scotland* of any crime or offence, or shall after due inquiry be judged by the General Council to have been guilty of infamous conduct in any professional respect, the General Council may, if they see fit, direct the registrar to erase the name of such medical practitioner from the register.

For Sect. XXIX.—The clause, as suggested by M. Ouvry, and printed in the *Tabular Statement* approved of, viz.:—

The Council may refuse to register any person who may have been convicted, in England or Ireland, of any felony or misdemeanour, or in Scotland of any crime or offence; and if any registered person shall be so convicted, or shall, after due inquiry, be judged by the General Council to have been guilty of infamous conduct in a professional respect, whether before or after registration, the General Council may, if they see fit, direct the registrar to erase the name of such person from the register.

XXXI. Every person registered under this Act shall be entitled, according to his qualification or qualifications, to practise medicine or surgery, or medicine and surgery, as the case may be, in any part of her Majesty's dominions, and to demand

Sect. XXXI. Every person registered under this Act shall be entitled, according to his qualification or qualifications, to practise medicine, or surgery or pharmacy or medicine, and surgery and pharmacy as the case may be, etc.

and recover in any Court of Law, with full costs of suit, reasonable charges for professional aid, advice, and visits, and the cost of any medicines or other medical or surgical appliances rendered or supplied by him to his patients: Provided always, that it shall be lawful for any College of Physicians to pass a bye-law to the effect that no one of their Fellows or Members shall be entitled to sue in manner aforesaid in any Court of Law, and thereupon such bye-law may be pleaded in bar to any action for the purposes aforesaid commenced by any Fellow or Member of such College.

XXXIV. After the first day of *January*, one thousand eight hundred and fifty-nine, the words "legally qualified medical practitioner" or "duly qualified medical practitioner," or any words importing a person recognized by law as a medical practitioner or member of the medical profession, when used in any Act of Parliament, shall be construed to mean a person registered under this Act.

To Sect. XXXIV. the following words to be added:—"According to his qualification or qualifications."

XXXVI. After the first day of *January*, one thousand eighthundred and fifty-nine, no person shall hold any appointment as a physician, surgeon or other medical officer, either in the military or naval service, or in emigrant or other vessels, or in any hospital, infirmary, dispensary, or lying-in hospital, not supported wholly by voluntary contributions, or in any lunatic asylum, gaol, penitentiary, house of correction, house of industry,parochial or union workhouse or poorhouse parish union, or other public establishment, body or institution, or to any friendly or other society for affording mutual relief in sickness, infirmity, or old age, or as a medical officer of health, unless he be registered under this Act: Provided always, that nothing in this Act contained shall extend to repeal or alter any of the provisions of the Passengers Act, 1855.

Sect. XXXVI.—The word "apothecary" to be inserted after "surgeon," in fifth line.

XXXVII. After the first day of *January*, one thousand eight hundred and fifty-nine, no certificate required by any Act now in force, or that may hereafter be passed, from any physician, surgeon, or other medical practitioner, shall be valid, unless the person signing the same be registered under this Act.

For Sect. XXXVII.—Substitute the following:—

After the first day of January, one thousand eight hundred and fifty-nine, no certificate required by any Act now in force, or that may hereafter be passed, from any physician, surgeon, or apothecary, or other medical practitioner, shall be valid, unless the person signing the same be registered under this Act.

XL. Any person who shall wilfully and falsely pretend to be or take or use the name or title of a physician, doctor of medicine, licentiate in medicine and surgery, bachelor of medicine, surgeon, general practitioner or apothecary, or any

On and after the day of 186 , it shall not be lawful for any person, unless registered under this Act, to pretend to be, or take or use the name or title of physician, doctor of medicine, licentiate in medicine or surgery, master in surgery, bachelor of

name, title, addition, or description implying that he is registered under this Act, or that he is recognized by law as a physician, or surgeon, or licentiate in medicine and surgery, or a practitioner in medicine, or an apothecary, shall, upon a summary conviction for any such offence, pay a sum not exceeding twenty pounds.

XLVIII. It shall, notwithstanding anything herein contained, be lawful for her Majesty, by Charter, to grant to the Royal College of Surgeons of *England* power to institute and hold examinations for the purpose of testing the fitness of persons to practise as dentists who may be desirous of being so examined, and to grant certificates of such fitness.

LV. Nothing in this Act contained shall extend or be construed to extend to prejudice or in any way to affect the lawful occupation, trade, or business of chemists and druggists and dentists, or the rights, privileges, or employment of duly licensed apothecaries in *Ireland*, so far as the same extend to selling, compounding, or dispensing medicines.

medicine, doctor, surgeon, medical or general practitioner, or surgeon apothecary or accoucheur, or licentiate or practitioner in midwifery, or any other medical or surgical name or title, and any unregistered person so offending shall forfeit and pay a sum of not exceeding £20, to be recovered in a summary way before the Justices of the Peace.

Sect. XLVIII.—Amend by introducing the words "*Ireland and the Faculty of Physicians and Surgeons*," after *England.*

Sect. LV.—Omit the words "Chemists, Druggists, and."

A Section to the following effect to be added:—

Sect. LVI.—It shall not be lawful for any person to keep open shop for the compounding of physicians' and surgeons' prescriptions, unless he be a licentiate of the Apothecaries' Hall of England or Ireland, or shall have received a certificate of competency to compound medicine from either of the above bodies, or from the Pharmaceutical Society, or from some other body duly authorized in England, Ireland, or Scotland, by the General Medical Council, to institute the necessary examination, and to grant such certificate, and at such rate of fee as the General Medical Council, with the approval of the Privy Council, may sanction: and any person keeping open shop for the compounding of medicine, unless qualified as aforesaid, shall, upon a summary conviction for any such offence before any Justice of the Peace, pay a sum not exceeding £20. And for the better protection of the public, and to ensure the carrying out of the provisions as aforesaid, it is hereby enacted that the Medical Council may appoint from time to time one inspector for England, one for Ireland, and one for Scotland, whose duties it shall be to inspect, as often as may be required, all shops where medicines are compounded, and to carry into effect the provisions of this Act in regard to such shops; and that such inspectors be paid such salaries out of the Consolidated Fund

as the General Council, with the approval of the Lords Commissioners of Her Majesty's Treasury, may from time to time determine.

A Section also to be added as follows:—

SECT. LVII.—No patent, quack, or other medicine shall be sold unless a sworn certificate of its composition be lodged with the registrar of the General Council, and a copy thereof be open for inspection in the shop or place in which such medicine is sold; and any person, or proprietor of a shop, selling any secret remedy shall, on summary conviction, for each such offence, be liable to a penalty not exceeding £20.

May 29, 1863. D. L. CORRIGAN, *Chairman.*

TO CORRESPONDENTS.

Wanted copies of the May, June, July, and August numbers of the Journal, 1852, for which the publishing price will be paid by Mr. Bremridge, 17, Bloomsbury Square, W.C.

T. S. A. (Boston).—Carbolic acid may be made by distilling coal-tar till anthracene begins to pass over; the resulting oil is rectified, collecting apart the portion which distils over between 150° and 200°; this portion is mixed with saturated potash-ley and pulverized hydrate of potash, whereby it is converted into a white crystalline magma; this is dissolved in hot water, and the oil which rises to the surface removed; the lower alkaline liquid neutralized with hydrochloric acid, and the impure hydrate of phenyl, which rises to the surface as an oil, is then washed with water and digested over chloride of calcium; rectified several times, and gradually cooled to −10° in a closed bottle.—*Gmelin.*

Chloroform and its Dilutions.—Dr. Charles Kidd, having been frequently applied to for the best form for *dilute* chloroform for inhalation, has sent the following formula for publication:—Take of chloroform, one part; well washed sulphuric ether, four parts: mix.

Ll. (Cambridge).—*Parietaria erecta* of Koch; *Parietaria officinalis* of Smith. It belongs to the Natural Order URTICACEÆ. It is in common language termed Wall Pellitory.

Toxos (Bath).—"Pasma" is, we believe, a proprietary article, the composition of which we are not acquainted with.

M. A. P. S. (Southport).—The quinine in the mixture referred to can only be dissolved by the addition of an acid.

A. P. S. (Chichester).—Students will, of course, be expected to make themselves acquainted with the New Pharmacopœia within a reasonable time.

A Pharmaceutical Apprentice (Salisbury) begs to correct a misprint in the third edition of Royle's 'Materia Medica,' in the formula given for *Fleming's Tincture of Aconite*, p. 272, where *ten* ounces of the root of *A. Napellus* are ordered, instead of sixteen ounces, to twenty-four ounces of spirit.

Mr. Charles Symes (Leamington) is thanked for his communication, which will receive attention.

CORRIGENDA.

Page 560, line 24, *for* "Physotigma" *read* "Physostigma."
Page 560, line 27, *for* "Mucura" *read* "Mucuna."

Instructions from Members and Associates respecting the transmission of the Journal before the 25th of the month, to ELIAS BREMRIDGE, Secretary, 17, Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Mr. CHURCHILL, New Burlington Street. Other communications to the Editors, 17, Bloomsbury Square.

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THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. V.—No. II.—AUGUST 1st, 1863.

THE PROPOSED NEW MEDICAL BILL.

We are not surprised that the proposal to introduce a new Medical Bill into Parliament, with clauses affecting pharmacy, and restricting the dispensing of medicines to men proved to be qualified for the duty, should have excited the attention of the Pharmaceutical Body; but we confess we were not prepared for the opposition that appears to be threatened to this measure. It cannot be supposed that it was ever contemplated, as some appear to think, that a large proportion of the chemists and druggists throughout the country should be deprived of the power of carrying on the business in which they have been engaged for many years. Such a proposition would be too preposterous to be entertained for a moment, and we think those who have taken alarm in anticipation of such a result have very little to justify their hasty conclusions.

The Bill, in the form in which it has been issued, contains but a rough draft of the proposed amendments. It would not be difficult to take exception to the wording of some parts of the newly-introduced sections, and to point out omissions which will have to be rectified when the Bill is put into form. In its present state, however, it serves to explain the principles which it is proposed to carry out, and with reference to which the opinions of the licensing bodies have been asked. We have already explained what we conceive to be the objects contemplated with reference to pharmacy, and they are quite in accordance with principles which have always been recognized by the Pharmaceutical Society. The adoption of these principles has repeatedly been urged upon chemists and druggists in the pages of this Journal, and we feel satisfied that no true friends to the Pharmaceutical Body will seek to raise an opposition to the proposed measure for extending their application. Of course, it is here assumed that this measure will be based upon a recognition of existing interests among the Pharmaceutical Body, without which, we repeat, no such measure could be carried. It has been insinuated that the Pharmaceutical Society would be benefited in some especial manner by the proposed Act, and that they therefore have a particular interest in promoting the measure. This we entirely deny. Indeed, so far is it from being the case, that we have no hesitation in saying that the measure would be a far greater boon to those who are without than to those who are within the pale of the Society. The principles of the proposed measure are the principles of the Pharmaceutical Society, and the members of the Society do not require the new Act to enable them to apply these principles, as far as the limited sphere of the Society is concerned; but having adopted and advocated these principles, which for the last twenty years the Society, and this Journal as its organ, have laboured to uphold and to extend, we are now anxious to see a favourable opportunity turned to the best account in furthering that object. We have no exclusive interest in promoting this,—on the contrary, self-interest might dictate a

different line of policy; but the interests we advocate are those of pharmacy and of the whole body of pharmaceutical operatives. If the proposed bill be carried into effect, it will necessarily cause a complete revolution in the state and practice of pharmacy in this country, involving, no doubt, many important changes in the constitution of the Pharmaceutical Society. Such changes would be rendered necessary by the altered circumstances under which all future dispensers of medicine would be required to possess a certificate of qualification. The sphere of action for the Society would be greatly widened, but at the same time it is probable that the nature of its operations would in some respects be restricted. Above all things, however, it is to be desired that the objects and interests of those who are engaged in the practice of pharmacy should, as far as possible, be carried out by united action and harmonious co-operation among the members of the trade generally.

THE BILLS BEFORE PARLIAMENT.

If the present session of Parliament has been less than usually prolific of important legislation, it certainly has not been deficient in small attempts at the passing of laws with which the readers of this Journal cannot fail to be interested. The committee appointed by the Council of the Pharmaceutical Society has been kept in a constant state of watchfulness and uncertainty by the proceedings which have taken place in the Legislature. Crude, undigested measures have been introduced, withdrawn, re-introduced, altered, and from time to time modified, so as to render it very difficult to know what was intended to be done or likely to occur. Now that the session is drawing to a close, and it will probably be ended before this is read, we have one bill, "The Poisoned Grain Prohibition Bill," that has passed,—one, the "Bill for preventing Accidental Poisoning," that has been summarily rejected,—one, "The Alkali Works Regulation Bill," which at this moment hangs between life and death,—one, "A Bill for Decimalizing our Weights and Measures," which, having passed a second reading with unexpected success, has been allowed to die a natural death,—and one, "The Exhibition Medals Bill," which is quietly passing at the end of the session without opposition. Those of the above measures not previously published in this Journal are inserted in the present number.

The bill for the prevention of Accidental Poisoning, which was introduced by Lord Raynham, and to which a brief allusion was made in our last number, we now publish *verbatim*, as a curiosity in its way; it may be interesting, historically, to refer to this bill hereafter in connection with the many attempts that have been made to legislate on the subject.

The Poisoned Grain Prohibition Bill, has been completely altered several times, but at last it has settled down to a comparatively inoffensive measure, the object of which is to prohibit the sale of poisoned grain, seed, or *meal*, or the placing of such poisoned substances upon any ground, or other exposed place or situation, where it may prove destructive to the life of animals. We have great doubts of the necessity or expediency of this measure, even in its present mild form, and especially since at the last moment the word 'meal' has been added to grain and seed. With this exception, however, the bill appeared to be rendered as little objectionable as it could be to have any effect at all. The ostensible motive for introducing the bill was the desire to protect small birds from destruction, much evil being stated to have occurred in some places abroad from the almost entire destruction of insectivorous birds. But we are not aware that evidence has been adduced to show that there was any danger of a similar result occurring in this country, or that there was occasion for granting immunity to sparrows

and other predatory animals to commit unlimited depredations upon farm and garden stock. Is it to be understood that these animals are to be allowed to multiply to any extent that an unlimited supply of food may induce, without any efficient means being permitted for their destruction? And if rooks and sparrows are to be protected at the cost of farmers' crops, why not extend this philanthropic legislation by protecting blackbeetles and other animals of a strictly domestic character?

The Bill for decimalizing our weights and measures having passed the second reading under a protest from members of the Government, has not been heard of since. It seems to have died of apoplexy. Several important communications, however, have appeared in the newspapers, in which objections have been urged against the metrical system, and many facts stated with reference to the operation of it in countries where it has been introduced. This will probably give rise to a more full and general discussion of the merits of the proposed measure than at first it seemed likely to obtain; and it is to be hoped before this or any similar bill is again introduced, that practical men will be able to realize, and to appreciate with some degree of accuracy, the consequences of such a change.

The Exhibition Medals Bill is a bill to prevent false representations as to grants of medals or certificates made by the Commissioners for the Exhibitions of 1851 and 1862. It imposes penalties of fine or imprisonment upon traders who commit any of the following offences:—

1. Falsely to represent that he has obtained a medal or certificate from the Exhibition Commissioners.

2. Falsely to represent that any other trader has obtained a medal or certificate from the Exhibition Commissioners.

3. Falsely to represent that any article sold, or exposed for sale, has been made by, or by any process invented by, a person who has obtained in respect of such article or process a medal or certificate from the Exhibition Commissioners.

THE PHARMACEUTICAL CONFERENCE.

It will be seen, by a notice at p. 58, that it is proposed to hold a pharmaceutical conference during the approaching meeting of the British Association at Newcastle-upon-Tyne. The number and the character of the signatures to the invitation afford good grounds for expecting, not only a numerous, but influential meeting; and from the results of the deliberations of such an assemblage of pharmaceutists from different parts of the country, we may hope, not only to obtain valuable contributions to pharmaceutical knowledge, but what is perhaps equally important, to diffuse a more lively and general interest among the young and active members of the profession in the investigation of scientific and practical questions relating to pharmacy. The subject has already been adverted to on two or three occasions in this Journal, and we believe the proposition, which has now for the first time assumed a definite and tangible form, has been responded to so promptly and with so much cordiality, that a successful issue may be confidently anticipated.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, 1*st July*, 1863,

Present—Messrs. Bird, Bucklee, Davenport, Deane, George Edwards, Evans, Hanbury, Haselden, Hills, Horner, Meggeson, Morson, Sandford, Squire, and Waugh,—the following were elected

MEMBERS.

BARNSTAPLE	Curtis, William.
LONDON	Thomas Grundy.
LONDON	Francis Middleton.
MAURITIUS	Marcel Amédée Gras.
"	Louis Edouard Guiot.
"	Etienne Nemours Merle.
YORK	Richard B. Tollinton.

MAJOR EXAMINATION, *July* 15*th*, 1863.

Borchert, Heinrich Theodor G.	Berlin.
Brown, George	Driffield.
Carteighe, Michael	London.
Fleeming, William	Wolverhampton.
Kerfoot, Thomas	Hyde, Cheshire.
Neve, Francis Charles	London.
Peele, Henry Anthony	Durham.
Umney, Charles	Bedford.
Wilson, Thomas	Stowmarket.

MINOR EXAMINATION.

Sharp, David Blakey	York.
Wootton, Alfred Charles	Luton.

REGISTERED APPRENTICES.

NAME.	RESIDING WITH.	ADDRESS.
Bright, Henry	Mr. Bright	Bath.
Mathews, Henry	Mr. Biggs	Hampstead.
Prockter, Alfred Edgcumbe	Mr. Wellington	Oakham.
Shaw, Henry Woolhouse	Mr. Wellington	Oakham.
Gilling, John	Messrs. Tomlinson and Hayward	Lincoln.

PROVINCIAL TRANSACTIONS.

LIVERPOOL CHEMISTS' ASSOCIATION.

At the concluding meeting of the session the following address was delivered by the President, J. SHAW, Esq.:—

Gentlemen,—We have again arrived at the end of another session, and the privileges and opportunities for improvement of which we were in possession at the commencement have all passed away, but, let us hope, not unimproved.

I have observed that the attendance at our fortnightly meetings has been quite as good

as that of former sessions, and from this circumstance we may gather that there still exists in the minds of our members and associates an interest in our Society, and a desire for the acquisition of further information on subjects connected with our profession. In reviewing our proceedings during the past eight months, I find that several important subjects have been brought before our notice; one of the first being that of Petroleum. This article, as all of you are aware, is not new to commerce, but one which has been known and collected in various parts of the world for many years, but the recent discovery of its existence in such great abundance in the United States of America and Canada has given to this oil an importance in a commercial point of view which must command the attention both of importers and consumers; and considering the immense area over which it exists, we may certainly calculate upon an almost unlimited supply for many years to come. In a recent official American document, it is stated that the district in the States and Canada over which it is found in greater or less abundance is more than 50,000 square miles. Immense quantities have been imported into Liverpool during the past year, and from its position we may expect that this town will be the principal port of entry into the United Kingdom.

Some little annoyance was felt on its introduction in quantities twelve months ago, in consequence of the unpleasant smell of some of the cargoes, especially those from the springs in Canada; and during last summer loud and very general complaints were made in reference to the nauseating effects arising from the oil wherever it was stored, and this was so offensive and so detrimental to the health and comfort of the inhabitants in some districts, that law proceedings had to be instituted, in order to abate the nuisance; but since that time greater care has been taken in storing the crude oil, so as to prevent leakage, and the apparatus and arrangements for its purification have also been considerably improved, added to which a large quantity is now imported in a purified state: so that from all these circumstances it is to be hoped that nothing will in future interfere with the free and liberal supply of an article which, like its congener coal, has been aptly designated the concentrated or consolidated sunshine of former epochs of the word's history, and which is now to be made use of, especially by the poor man, in producing an artificial sunshine—though far inferior to the original—around the hearths and homes which, alas! in too many instances the rays of the great luminary are permitted to enter only to a very limited extent. A number of other papers followed in due succession, and on the last occasion of our meeting, three weeks ago, we were favoured by Dr. Nevins with a highly interesting lecture on the Cultivation of the Cinchonas in India; and from the manner in which he brought the subject before us, every one, I feel assured, must have been much gratified. It is a matter of national and even world-wide importance, seeing that quinine has so firmly established itself as one of the most valuable remedies of the materia medica; and that hitherto, Peru and the adjoining countries have been the only sources from which we have received our supplies of the bark from which this article is procured.

And I may here remark that botanical subjects have scarcely had their fair share of attention during the past session; however, I trust that this branch of our education will receive due consideration by our younger friends during the summer months.

You have been already informed that the prize usually given by the President of this Association to the pharmacy class has been offered this year for competition to botanical students; and I think I need not remind you that an intimate knowledge of this science should be enjoined upon every one before undertaking the very responsible duty of a Pharmaceutical or Dispensing Chemist, and more especially of those whose duty it is to purchase the various vegetable remedies of the materia medica from the cultivators and importers. Dr. Thomson, in his Dispensatory, when speaking of *Helleborus niger*, says that sometimes the roots of *Helleborus viridis*, *Adonis vernalis*, *Trollius europæus*, *Actæa spicata*, *Astrantia major*, *Aconitum neomontanum* are either ignorantly or fraudulently substituted for those of the Black Hellebore; hence the necessity for being able to guard against the substitutions. But independently of the necessity of such a qualication, I think that botany is one of those branches of natural science which must commend itself to every one from the pleasure which is derivable from its pursuit. It has often occurred to me that our teachers of botany would be more successful in inducing a greater love of the science, were they to commence each course of lectures in a more popular and practical manner, and gradually take up the more difficult and to a novice less interesting part, namely, the minute structure, elementary tissue, microscopical examina-

tion and physiology of plants; and I may also add, that notwithstanding we have so many facilities for becoming thoroughly acquainted with this science, yet comparatively very few have anything like an intimate knowledge of the vegetable kingdom,—not even of those plants, either indigenous or cultivated, with which we come into contact in our rambles in the country. In Britain we are not favoured with that gorgeous and luxuriant vegetation which commands the admiration of travellers in the tropics, and which often induces a love of botanical pursuits, and a desire to cultivate the science more intimately; yet we are not without a profusion of vegetable beauty, which has enraptured those who have seen a good deal of the world. A popular writer has recently and enthusiastically made the following remark:—"We back Great Britain and Ireland against the world for possessing the richest treasures of all that is beautiful, grand, and loveable in nature." It is also recorded that when Linnæus visited this country in the year 1736, and for the first time beheld the bright golden blossoms of the gorse or furze (*Ulex Europæus*) on the broad spreading commons near London, especially on Putney Heath, so great was his delight that he fell on his knees in a rapture at the sight. He was always an admirer of this plant, and vainly tried to preserve it through a Swedish winter in his greenhouse. It is a plant with which you are all acquainted; and those of you who have visited West Kirby, in Cheshire, about this time of the year, and seen it blooming in such profusion, will not wonder at the ecstasy of delight which was produced in the mind of the great naturalist.

There is however a growing taste springing up in this country for this delightful study; and when we look at the success which has attended the society which was originated by this Association, and having for its chief object a better and more practical acquaintance with the indigenous plants of this district, namely, the Liverpool Naturalists' Field Club, we may look forward with confidence to the future.

A national impetus is often given to the study of a branch of science when we find it taken up and cultivated by men renowned for their scientific attainments, or by the example of those who in their social position might be expected to influence the popular mind and taste. It is well known that the late lamented Prince Consort took considerable interest in this department of natural history, and had a small plot of ground at the Swiss Gardens at Osborne allotted to each of the royal children, when quite young, for the cultivation of flowers, etc.: and the teaching of botany now forms a part of the programme of our less scholastic establishments in this country.

As a rule, I believe that natural history is more generally cultivated among the middle classes on the Continent than in this country, and, as regards Sweden, I believe this is particularly the case,—no doubt incited by the example and talents exhibited by one of her sons, the immortal Linnæus. Sir J. E. Smith, when recommending the study of natural science to the rising generation, says that in Sweden natural history is the study of the schools by which men rise to preferment; and Dr. Clarke, in his travels in that country, has borne testimony to the zeal with which he found the science of botany pursued, and relates an interesting anecdote illustrative of that statement:—"On his arrival at Tornea, at the northern extremity of the Gulf of Bothnia, Dr. Clarke sent to the apothecary of the place for a few jars of the conserved dwarf Arctic Raspberry (*Rubus arcticus*). He had observed this rare plant in the woods near the shore where he landed, and found it bearing the first ripe fruit he had seen upon it. The flavour of its berries he thought finer even than that of the Hautboy Strawberry, and equal in size to those of our common Raspberry, but the plant so diminutive in size that an entire tree, with all its branches, leaves, and fruit, was placed in a phial holding about six ounces of alcohol. The fruit is annually collected and preserved; and wishing to send some to his friends in England, Dr. Clarke purchased a few jars for that purpose. They were brought by a boy without shoes or stockings, who, having executed his errand, was observed to cast a longing eye towards some books of specimens of plants which lay on the table ready for arrangement. To the surprise of the traveller, he named every one of them as fast as they were shown to him, giving to each its appropriate Linnæan appellation. They found on inquiry that this extraordinary youth was the son of a poor widow, who had placed him an apprentice under this apothecary. His master himself had a turn for natural history, nevertheless he did not choose that his young pupil should leave the pestle and mortar to run after botanical specimens; it interfered, he said (which was probably the truth), with the business of the shop. The consequence was that the lad had secretly carried on his studies, snatching every hour he could spare to ramble barefooted

in search of a new plant or insect. These facts interested Dr. Clarke and his companions so much in behalf of the poor little Pyppon, for that was his name, that they showed him much kindness. But the hour of separation from his kind stranger-friends came all too soon, and the little naturalist, shedding abundance of tears, bade them farewell, making this touching request at parting, "If you should remember me when you arrive in your own country, send me *Drosera longifolia;* I am told it is a common plant in England."

While speaking of Sweden, I am naturally reminded of little traits in the life of the great naturalist who, amid the dry plodding work of the formation of a new classification, and the attaching of appropriate names to plants, alighted occasionally on some little circumstance which relieved the monotony of his labours; and for classical allusion and romantic feeling a more striking example cannot be given than the naming of the plant *Andromeda polifolia*. It is stated that in traversing the uncultivated wilds of Lycksele, Lapland, whither, while yet a young man, Linnæus was sent by the Royal Society of the University of Upsal on a tour of scientific research, he found this plant in great abundance, decorating the marshy grounds with its delicate blossoms. It is a beautiful little flower, somewhat resembling one of the Heaths, the buds of a blood-red colour before they expand, but when fully blown the corolla is of a flesh colour. In contemplating the delicate blossoms of this plant, the imaginative mind of the naturalist was struck by a fanciful resemblance in the appearance and circumstances of it to the story of Andromeda, as related by the ancient poets. Andromeda, you will recollect, was the daughter of Cepheus and Cassiope, king and queen of Ethiopia, and she, contending with the nymphs for the prize of beauty, and, in consequence of her mother proudly preferring hers to theirs, she was bound by the nymphs to a rock, to be devoured by the sea-monster; but Perseus slew the monster, loosed her, and married her. Linnæus observed that this lovely little flower is her vegetable prototype. Scarcely any painter could imitate the beauty of a fine female complexion, still less could any artificial colour upon the face bear any comparison with this sweet bloom. He adds, it is always fixed upon some turfy hillock, amid the swamps, and its roots bathed by their waters. In these marshy and solitary places toads and venomous reptiles abound; and just as in the case of Andromeda, Perseus coming to deliver her from her dangers by chasing away her foes, so does the summer, like another Perseus, arrive, and drying up the waters that inundate the plant, chase away all her aquatic enemies, and then she carries her head (the capsule), which before had drooped pensively, erect, and displays her beauties to the sun. Pleased with the idea, he chose for this flower, which formed a new genus in the botanical system he was then arranging, the name of *Andromeda*.

At the commencement of the session I looked forward to the publication of the National Pharmacopœia before our meetings were brought to a close, but in this respect we have not been gratified. You are aware that it was intended to change the value of the grain-weight hitherto in use, and the new formulas were proposed accordingly; last year, however, about the time of our first meeting, the Pharmacopœia committee reconsidered the intended change, and I am happy to say that we shall now retain the standard grain intact, the only alteration being the adoption of avoirdupois weight instead of the apothecaries', and which change, I have no doubt, will meet with the approval of chemists and druggists. It is perhaps partly to this circumstance that we may attribute the delay of the publication of the work, the formulas of course requiring revision; and while on the subject of the Pharmacopœia, I would just observe that the Medical Council, having decided to publish the work in the English language,—a decision which must commend itself to the approval of all, when we consider that perhaps in nineteen cases out of twenty the English translation of former Pharmacopœias has been made use of by the chemists and druggists in preference to the Latin edition,—might, I think, advance a step beyond their province, and *recommend* physicians to write the *directions* of their prescriptions in English. This is a subject which has been discussed before; and while I consider it very advisable, or even essentially desirable, that the formulas should be written in Latin, as has hitherto been the practice, I cannot see any valid reason why the directions should not be written in English. Not that I entertain the least doubt of the general competency of pharmaceutists having the responsibility of dispensing prescriptions to translate them correctly, but it would, I feel assured, in very many instances, prove a source of satisfaction to the patient or those in attendance, in case of any doubt, to verify the correctness by reference to the original. Instances have occurred where, in the press

of business, 'tablespoonful' has accidentally been written instead of 'teaspoonful' by the dispenser. Directions have also been written occasionally which were not quite so legible as might be. Bottles containing mixtures and liniments are also very liable to have their labels partially defaced by the carelessness of the nurse in pouring out their contents. In all these cases a reference to the directions in the prescription would obviate any difficulty. I am not aware that any sufficient reason can be advanced against the general adoption of the practice. I may observe that it is becoming much more frequent than it was formerly, and several eminent physicians and general practitioners do it invariably. I have seen it somewhere stated that it is an advantage to have a prescription written entirely in Latin, so that in these days of cheap travelling and intercommunication with foreign countries, it might with equal facility be dispensed in any part of Europe; but practically, this facility would in no manner be interfered with.

As I have mentioned to you on a former occasion, the great object which this Association has in view is the raising of the qualification of the rising generation of chemists and druggists; and this I hope will be steadily kept in view, and that our labours, however humble, will be directed to one common object, namely, the happiness and prosperity of the nation at large. Since the commencement of the session, I am glad to observe that two Societies, identical, I believe, in their object and constitution with this, have been inaugurated with every prospect of success, namely, one at Leeds, and the other at Nottingham; and I should be glad to see other important towns following in the same path. It would prove one of the most efficient means of strengthening and forwarding the object of our national exemplar, the Pharmaceutical Society, which has laboured anxiously, earnestly, and not unsuccessfully for upwards of twenty years in promoting the education and welfare of the chemists and druggists of Great Britain, and which Society it should be our duty and pleasure to support by all the means in our power. It has rendered good service to the cause of pharmacy, and is destined, at no distant day, to be the lever by which the chemists and druggists of this country are to be raised to an educational status equal to that of the pharmaceutists of the greater part of the continent of Europe, and to that social position corresponding to the responsible duties they are called upon to perform.

Science, during the past century, has done much for us, but there are hidden mines of knowledge which have yet to be opened, worked, and applied for the benefit of mankind. In this age of progress what mighty changes have taken place, and mostly the result of scientific skill; and many of the most important are more or less the result of chemical investigation. I was interested a short time ago by seeing an old flint, steel, and tinder-box, that had seen good service many years ago, but which now had been consigned to a quiet existence,—comparatively speaking, neglected, but not forgotten, for the owner appeared to value them as relics of bygone days; their services, however, have been superseded by one of the triumphs of chemical science, namely, the ordinary friction-match,—an article that every member of the civilized world will value for its utility and convenience, and the great loss of which we could form only a slight conception by being carried back for a few months to things as they were thirty or forty years ago. Also our cities and towns, and even some of our villages, notwithstanding the periodical departure out of our sight of that great luminary from whence all light, whether natural or artificial, directly or indirectly proceeds, are now brilliantly lighted up during the night, and form a strange contrast to what we are told existed half a century ago. Many other results of chemical skill, both in connection with medicine and the arts generally, might be mentioned. The land, which formerly yielded a good return of the fruits of the earth which administer so much to our comfort and actual existence, has, by the aid of agricultural chemistry, been made to yield her increase in greater abundance; and also by the aid and adaptation of chemical knowledge to mechanical appliances, the labour which in years gone by required so many weeks is now accomplished in as many days, and this at an immense saving of human as well as animal life; and the fact now demonstrable that the combustion of one pound of coal properly applied being equivalent to one day's work of a man, in certain descriptions of labour, has been of incalculable value to the comfort both of man and of the brute creation. We have our steamboats constantly ploughing the Atlantic from shore to shore,—a thing considered impossible not many years ago. We have our railway system like a network over the kingdom, contributing to the comfort and celerity of travelling, and opening up mines of wealth, both in the mineral and vegetable kingdoms, in this and many other countries of the

globe; and notwithstanding the *dictum* of the Lords of the Admiralty only a few years ago, that telegraphs were of no use in time of peace, and that during war the semaphore answered all required purposes, we have thousands of miles of electric telegraph wire suspended, by which to transmit our thoughts, words, and actions, literally as quick as lightning, over a large portion of the civilized world; and the mere entertainment of the possibility of this latter fact would at no very distant period have laid the believer in its accomplishment open to the charge of wishing to search into the hidden things of God, and to possess himself with that power which belongeth only to Omnipotence itself and not to created beings. And those of you who witnessed in this room a few weeks ago the marvellous performance of the telegraphic machine invented by Chevalier Hughes, will recognize the rapid strides which science and invention are yet making.

In conclusion, I may observe, that in the language of a late author, "the progress of natural science is indeed leading us apace to a more intimate acquaintance with creation and its objects, but the capacity of man's intellect has not yet enabled him to discover the whole of the work of the Almighty Hand; but there is a feeling worthy to mix in the pure contemplation of nature and science, and that is the anticipation of the pleasure we may have to bestow on kindred minds with our own in sharing with them our discoveries and acquirements; and the gratification of communicating virtuous disinterested pleasure to those who have the same tastes with ourselves, or of guiding young ingenuous minds to worthy pursuits and facilitating the acquisition of what we have already obtained, is truly an object worthy of a good man. Some there are, perhaps, that will ask, where is the good?—considering not, as regards botany for instance, that our food, our clothing, and our medicine principally, are directly or indirectly dependent on the vegetable kingdom, and therefore the more we know of its productions the more efficiently shall we value and supply ourselves with these benefits. This consideration, however, should not be the whole aim and end of our existence, but, in the language of Sir J. E. Smith, "Is it not desirable to call the soul from the feverish agitation of worldly pursuits to the contemplation of divine wisdom in the beautiful economy of nature? Is it not a privilege to walk with God in the garden of creation and hold converse with His Providence?" If such elevated feelings do not lead to the study of nature, it cannot far be pursued without rewarding the student by exciting them.

An excursion of this Society to Runcorn Gap and Garston took place on Friday, the 3rd of July. About thirty members and friends assembled at the Garston Railway Station, and proceeded by the 11.55 A.M. train to Runcorn Gap. On arriving there they walked to the Woodend Copper Works of Messrs. Charles Lambert and Co., where they were met by the manager, Mr. Hopkins, who led them through the works, and explained to them the various processes connected with copper-smelting as carried on in those works on a very extensive scale, Messrs. Lambert and Co. being one of the largest copper-smelting firms in the kingdom. The ore-yard was first visited, and there the various kinds of ore, and the methods of preparing them for smelting, were examined. The calcining furnaces were next inspected, where the ores are subjected to the process of roasting in order to expel the sulphur and some other substances which they contain. The sulphur in the works of Messrs. Lambert is employed for the manufacture of sulphuric acid; but in many copper works the sulphurous gases are allowed to escape up the chimney into the atmosphere to the annoyance and damage of the surrounding country. From the calciners the party proceeded to the melting furnaces, in which the calcined ore is converted into regulus, or, as it is technically known, 'coarse metal.' This operation consists in melting the ore with a certain quantity of sand or slag (sometimes a little coal and lime is added to the charge). The iron and other impurities separate in the form of slag, which is principally silicate of iron, whilst the copper is converted into sulphide, and, being heavier than the slag, sinks to the bottom of the furnace. The melting operation occupies about five hours, and the slag is then skimmed out through an opening in the front of the furnace, care being taken not to draw out any of the metal at the same time. A hole in the side of the furnace, called the 'tap-hole,' is then opened and the metal runs out into sand-moulds placed to receive it. When sufficiently cool the regulus is removed from the moulds to another part of the works, and the slag is thrown away, or used for road-mending or any other purpose for which it may be found useful. The 'coarse metal' is afterwards subjected to two or three other processes

of calcination and melting, in order to separate the sulphur, etc., which it contains, from the copper. A description of these processes would occupy too much space to be here given, but we may just mention that there are successively produced calcined coarse metal; metal, or white metal, which contains from 65 to 75 per cent. of copper; and blister-copper, containing about 95 per cent. of copper.

The last operation is termed 'refining,' and upon leaving the melting-furnaces Mr. Hopkins conducted the party to witness this process. About six or seven tons of 'blister-copper' is introduced into the refining-furnace and there melted, and kept, in a melted state, exposed to the oxidizing action of the air which enters the furnace. The slag which forms is skimmed off, and the workman takes out a small quantity of the copper in a ladle, and after allowing it to cool examines its fracture, and judges whether the process of oxidation has been sufficiently prolonged. If it has, the process of toughening is commenced. The metal is first carefully skimmed, and some good coal (anthracite answers best) is thrown upon the surface. After a short time a long wooden pole—of oak or birch, and as green as possible—is thrust into the melted copper. The wood is rapidly decomposed, and much gas and vapour evolved, which causes the metal to be violently agitated, and every part of it exposed to the reducing action of the coal upon its surface. This operation is termed 'poling.' From time to time the workman takes out a small quantity of the metal, or 'proof,' as it is termed, and tests its qualities, and when he finds that the process is finished, the metal is ladled out as rapidly as possible into copper moulds. The process of moulding was proceeding at the time we visited the refinery, and we were much pleased with the manner in which it was conducted. A number of moulds were first made from the melted copper by means of a machine for the purpose. These were ranged over a trough of water upon stands so hinged that, as soon as the moulds were full and the copper had sufficiently solidified, they could be turned over into the water and the metal cooled rapidly. This concludes the smelting process, and the copper is ready for removing from the works. Several other interesting processes are carried on in the works of Messrs. Lambert, but time would not allow them to be inspected, but the party left the works about a quarter past one o'clock, highly pleased with their visit.

They next proceeded to the Moss Bank Bone Works of Messrs. J. Knight and Co., where, under the guidance of Mr. Knight and his partner, Dr. Edwards, of Liverpool, they inspected the several interesting processes for manufacturing animal charcoal, superphosphate of lime, and other artificial manures, and various products for which this firm is so well known.

The next movement was to a field adjoining the works, where, under cover of a tent, a most sumptuous luncheon had been provided by Dr. Edwards. The company having taken their places, grace was said, and a hearty onslaught was then made upon the good things provided; and we must say that the liberality of Dr. Edwards appeared to be fully appreciated, and will no doubt be long remembered with pleasure by all those who experienced it. After luncheon several toasts were drunk, including the Queen and Constitution, the health of Dr. Edwards and Mr. Knight, "Success to the Chemists' Association," "Success to the Moss Bank Bone Works," the health of the President of the Society, John Shaw, Esq.; the Honorary Secretary, Mr. Norman Tate; Mr. R. Clay, the first President; and others connected with the Society.

At three o'clock the signal was given to return to the Runcorn Gap Station, to meet several friends expected by the 3.35 train. Upon the arrival of this train the party received an addition of about a dozen gentlemen, and then proceeded to the alkali works of Messrs. Gaskell, Deacon, and Co. The various processes carried on in these works were shown and explained by Mr. Deacon and his chemist, Mr. Eustace Carey. We were particularly struck with the admirable arrangement of these works, everything appearing to be just in its right place, each department complete in itself, yet conveniently connected with the others; so that all waste of time, labour, or material, is most efficiently prevented. We understand that this firm received a medal at the International Exhibition of 1862, and judging from the specimens of their manufacture which we noticed in the works, they well deserved it. The excellent quality of their crystallized carbonate of soda and their bicarbonate of soda was very much admired; and amongst the gentlemen present were some good judges of those articles.

The next works visited were those of Messrs. J. Hutchinson and Co., where the party was met and shown through the works by the manager, Mr. Powell, and the chemist,

Mr. Henry Brunner. These works are very extensive, and afforded an excellent opportunity for the inspection of all the various processes of the alkali manufacture, which the gentlemen present did not fail to take advantage of. This firm also received a medal at the International Exhibition, and certainly the honour in this case was deservedly bestowed, for notwithstanding the extensive scale on which their processes are conducted, all the various articles manufactured by them which we saw were of excellent quality, especially their bicarbonate of soda. At these works the visitors were lucky enough to have an opportunity of examining the construction of a sulphuric acid chamber, as one of the many chambers in this establishment was in course of repair.

In passing through these works we could not help thinking what a great contrast they presented to the soda works of days gone by.

Formerly, in order to procure the alkali, it was the practice to grow the *Salsola Soda* or the *Salicornia herbacea* in the warm climates of Spain and the Mediterranean, and the *Fucus vesiculosus, serratus, digitatus, nodosus*, and other fuci in these more northern climes. These alkali nurseries were of course placed on the seashore, for there only could the organic laboratories find sufficient salt to subject to the decomposing action of their energetic powers; the plants were burnt to ashes, forming barilla, or kelp, and the soluble portion was then separated by water from the insoluble earthy matter, sand, etc. The carbonate of soda was afterwards separated by crystallization from the other soluble salts. The ashes of the plants just mentioned contained from 2 to 20 per cent. of carbonate of soda. Previous to the establishment of the French Republic in 1793, there was hardly any soda made except by this process, and of course the supply was exceedingly limited.

The soda process, as carried on at the present time, was invented by a French apothecary (*un pharmacien*) named Le Blanc. It consists,—1st, in the decomposition of common salt by means of sulphuric acid, the products being sulphate of soda, technically known as 'saltcake' and hydrochloric acid. 2nd. The decomposition of the sulphate of soda by fusing it with carbonate of lime and carbon, the product being what is technically called 'black ash,' or 'ball soda,' which consists essentially of carbonate of soda and sulphide of calcium. 3rd. The separation of the carbonate of soda from the sulphide of calcium by lixiviating the black ash with water. The solution obtained is evaporated to dryness, and the residue roasted in a reverberatory furnace, the product being an impure carbonate of soda, known as 'soda ash,' and containing from 50 to 55 per cent. of alkali.

To manufacture crystallized carbonate of soda, a saturated hot solution of soda ash is made, and after being allowed to settle to separate impurities, it is run into large iron pans, where, as the liquor cools, the carbonate of soda crystallizes out almost perfectly pure. The mother-liquor from the crystals contains most of the sulphates and chlorides, and also carbonate of soda. It is evaporated to dryness, and the residue roasted to form what is known as 'weak ash' or 'crystal ash.'

Bicarbonate of soda is procured by placing the crystals of carbonate of soda in a close leaden chamber, and subjecting them to an atmosphere of carbonic acid; water separates, and the carbonate of soda takes up another equivalent of carbonic acid. The lumps of bicarbonate are taken from these carbonating chambers to the drying kiln, where they remain for a few days, and are then removed to the mill, and ground ready for market.

The hydrochloric acid evolved in the first process was, in the early days of manufacture, allowed to escape, and caused considerable damage to the surrounding neighbourhood. After the manufacturers had been put to considerable trouble and expense to remedy this, Mr. Gossage invented the arrangement which is now in use for condensing the acid gas. It consists of towers filled with pieces of coke or bricks, and as the gas passes up through the towers, a stream of water runs down, and, coming in contact with the gas, condenses it. A Bill is now before Parliament for preventing the escape of these deleterious gases from alkali works, and if it becomes law, which it is almost certain to do, inspectors will be appointed to examine the alkali works, and all manufacturers allowing an escape of more than 5 per cent. of muriatic gas, will be liable to a heavy fine. This being the case, we were particularly careful in noticing the condensing apparatus of the works we visited, and have much pleasure in saying that both at the works of Messrs. Gaskell, Deacon, and Co., and those of Messrs. Hutchinson and Co., the condensing apparatus was most efficient, every possible care being taken in both works

to prevent the escape of gas. We could not detect the least appearance of gas escaping from the chimneys.

But we must now pass on to say a few words respecting the soap works of Messrs. Gossage and Sons. The members of the party were conducted over the works by Mr. Gossage, the senior partner, and his sons, Mr. F. H. Gossage, and Mr. Alfred Gossage. We were first shown the boiling-house, in which are ten large soap-coppers arranged in one line, each of them provided with pipes and troughs, by which melted tallow and oils are supplied to the coppers by engine power; and other pipes through which steam is introduced to effect the boiling of the soap: also other appliances, by which the spent lyes are run off from the soap-coppers without the usual labour of pumping. We will not stop to describe the process of soap-making, as our space is almost occupied; but we must not omit to mention a very ingenious contrivance, invented by Mr. Gossage, for transferring finished soap from the coppers to the frames or moulds, for cooling, by means of compressed air. This operation, by the ordinary method, would occupy probably twenty workmen for three or four hours. The apparatus by Messrs. Gossage and Sons effects it in a quarter of an hour or twenty minutes, the attendance of three men only being required. One part of Messrs. Gossage's works which afforded much gratification to the visitors, was that in which the silicate of soda, or soluble glass, is prepared. At the time of the Russian war, tallow and other fats and oils became very greatly enhanced in price, and it occurred to Mr. Gossage that a substitute might be found to answer the purpose of tallow, etc., in soap-making, so as to render this country less dependent upon Russia for that article. In his search for this substitute, Mr. Gossage experimented with silicate of soda, which he found to answer the desired purpose, and he is now producing a soap into which this silicate is introduced, which is not only quite equal to the tallow-soap, but is very much cheaper. Gossage's soap is, no doubt, familiar to many of our readers, who will remember the Soap Obelisk at the International Exhibition. Smaller obelisks may also be seen in many of our shop windows. Many other interesting particulars might be mentioned in connection with these works, but we must reluctantly pass them over. Mr. Gossage, the senior partner, is a gentleman well known in the chemical world for his numerous inventions connected with the alkali trade; and not only has he effected numerous improvements in the alkali manufacture, but, as we had an opportunity of witnessing when we visited the works, his improvements in the soap-making process have effected wonders.

The party left Runcorn Gap at 5.50, and on arriving at Garston, inspected the Garston Salt Refinery, under the guidance of Mr. Holland and Mr. Burgess. After remaining here about three-quarters of an hour, and being much pleased with their visit, they adjourned to the Garston Hotel, where an excellent dinner was provided by the hostess, Mrs. Birkett. About forty sat down. The President, John Shaw, Esq., occupied the chair, and Mr. Abraham (in the absence of the Vice-President) the vice-chair.

After the dishes had been removed, the President proposed "The Health of Her Majesty the Queen," which was drunk in a truly patriotic manner. The President next proposed "The Prince and Princess of Wales, and the rest of the Royal Family." This toast was also, of course, loyally received.

The Vice-Chairman then gave the toast of "The Army, Navy, and Volunteers," which was responded to by Captains Knight and Walker, both members of the latter force. "The Health of Her Majesty's Ministers" was then proposed by the Vice-Chairman, and duly honoured.

Mr. C. T. Gilson proposed the next toast, "The Town and Trade of Liverpool," which was responded to by Mr. Robinson.

The toast of the evening, "The Chemists' Association," was proposed by Dr. Nevins, in extempore rhyme, and the manner in which several members of the company were alluded caused considerable amusement. Mr. Abraham and Dr. Edwards responded.

Mr. S. Banner proposed the next toast, "The Honorary Members of the Association," coupled with the name of Dr. Nevins.

Dr. Nevins having responded, called upon Dr. Collingwood, another of the honorary members present, to acknowledge the compliment, which he did.

Mr. Norman Tate then proposed "The Kindred Societies," coupled with the name of Dr. Collingwood, who is officially connected with several of the Liverpool Scientific Societies. Dr. Collingwood having responded,—

Mr. Abraham proposed the following toast, "The Pharmaceutical Society of Great Britain." In the course of his speech, he said, "Of the matters agitating the Pharmaceutical mind at present, one was the proposed introduction of the French system of weights and measures. He did not doubt that that system was better than our own, but he thought that many who supported its speedy introduction had hardly realized the embarrassment which would be occasioned. If their customers would ask for what they wanted in grammes and litres, their multiples and submultiples, and if the medical profession would prescribe in like manner, he saw no difficulty in the way of Pharmaceutical Chemists selling and dispensing by those weights. But he thought that it would be a long time before their customers would learn to ask for a four-grain blue pill, or an ounce of salts in the new terms, and before the medical profession would abandon the grain and the drachm. In the meantime, if the Bill before Parliament were passed, even with the amendments which we all agreed were necessary, the trouble and inconvenience would far exceed anything which we suffer now. Even if we could overcome these difficulties, what would our wives and daughters say if they were required to buy their butter by the kilogramme, their milk by the litre, and their ribbons by the metre? He thought that they ought to disuse unnecessary weights in their own system, to decimalize it where practicable, as in the uses of the cental instead of the hundredweight, and to decimalize their coinage by making tenpence a shilling, and that changes should be made gradually."

Dr. Edwards responded on behalf of the Pharmaceutical Society, and also made some remarks respecting the Weights and Measures Bill, and the Poisoned Grain Bill.

Mr. Gossage next proposed "The Health of the President, John Shaw, Esq."

The President, in reply, thanked Mr. Gossage for the very kind manner in which he had proposed his health, and also the company for the warm reception with which the toast had been honoured. He felt convinced that he was not personally entitled to such an enthusiastic response, and must therefore believe that the honour was more especially due to the office. He assured the company that he very much appreciated the honourable position which he occupied as President of the Liverpool Chemists' Association, and that the time which he had devoted to the Society was a source of pleasure and satisfaction. He regretted that their time that evening was rather limited, otherwise he should have been glad to have heard some further remarks in reference to two or three Bills at present before Parliament, in which they were more or less interested. He alluded particularly to that entitled "The Poisoned Grain Bill," the origin of which he believed might be traced to suggestions and influence exerted by game-preserving landlords. The destruction of sparrows and other small birds was perhaps greater than need be, and very likely impolitic as regards the farmers' interest; but if such was the case, we may wonder that the farmers themselves have not been the prime movers of the bill, but on the contrary, for many years past have authorized parish and township voluntary rates to be levied for the purchase of all sparrows destroyed, and this practice still exists to a large extent in several parts of England. He believed that the prohibition of the use of arsenic at seedtime in many districts, and an indirect additional game-preserving bill, in which sparrows, etc., are to be included, would not be conducive to the interest of the British farmer.

With regard to the Weights and Measures Bill, he was decidedly of opinion that the adoption of the metrical system in this country was very desirable. The principle he thought was good, and the system, when fairly introduced, would much expedite business. The great difficulty would be its introduction into general use; but surely if France, Belgium, and several other countries have overcome that difficulty, England need not fear to grapple with it. The time mentioned in the bill at which it is to be made compulsory, he considered much too short, and thought that ten years at least would be required for the whole community to become acquainted with and accustomed to the change, and during that time every effort might be made by government and school teachers, etc., to thoroughly instruct the public in the new system. Another objectionable feature in the bill he considered was the retention of the terms pound, pint, quart, etc.; this had been one of the evils attending former alterations in weights and measures, and he thought that if the metric system is adopted in this country, the names of the various weights and measures should be precisely the same as those used in France, and this he thought would render the change more decided and satisfactory eventually.

The following toasts were afterwards proposed and duly honoured:—

"The Health of the Vice-President;" "The Council and Officers," proposed by Captain Walker, and responded to by the Honorary Secretary, Mr. Norman Tate; "The Manufacturers whose works were visited," proposed by Mr. Mercer, who associated with the toast the name of Mr. William Gossage, to whom he alluded in a very complimentary manner; "The Press," and "The Ladies."

After all the above toasts had been disposed of, the proceedings terminated, every person appearing well satisfied with the excursion, and the dinner which ended it.

COLCHESTER DRUGGISTS' ASSOCIATION.

At a meeting of the Colchester Druggists' Association, held July 17th, 1863, for the purpose of taking into consideration the two Bills now before Parliament having for their object the prohibition of the sale of poisoned grain, and the introduction of the decimal system of weights and measures, the following resolutions were unanimously agreed to:—

1st. That, with respect to the Bill for prohibiting the sale of poisoned wheat or grain, in its amended form, there was, in the opinion of the meeting, so little in the measure calculated to affect the interests of the trade, prejudicially or otherwise, as to render it unnecessary for them to take any action with reference thereto.

2nd. With respect to the introduction of the decimal system: that although the members have no objection to the principle of decimalizing weights and measures, yet they would prefer not giving any active support to the Bill now before Parliament, inasmuch as they think it will be unwise to alter the present familiar system until one can be substituted for it sufficiently perfect in its details to be final. E. HAMMERTON, *Chairman.*

PHARMACEUTICAL CONFERENCE.

The undersigned invite their Pharmaceutical brethren to unite in a conference, to be held at Newcastle-upon-Tyne, during the Meeting of the British Association for the Advancement of Science, which commences August 26th, 1863.

It will already be known that the idea of such a meeting was broached several years since by Mr. Schacht. We believe that the time has arrived for its realization. Our body now includes some hundreds of members who have received a professional training, and the exertions which may fairly be demanded from these for the advancement of Pharmacy, require co-operation for their most successful development.

Our names will guarantee that the present proposal is not in the slightest degree antagonistic to the Pharmaceutical Society, and we advisedly consider that the object and interests of that Society would be promoted precisely to the extent that the Conference became successful and influential.

The objects of such Conference would be as follows:—To consult whether it is desirable to establish an Annual Conference on Pharmacy, either meeting at the place and time of the Meeting of the British Association, or otherwise.

If accepting such a proposal, to complete the organization of an Executive; to recognize the various Provincial Chemists' Associations, and consider how best to promote their union; to discuss and allot for investigation subjects in Pharmacy which demand inquiry, whether referring to new remedies, or processes, or adulterations; to appoint committees for any allied objects, etc.

The proposed plan of operations involves no costly outlay, no salaries, no publishing department: viewed as an experiment, it is a perfectly safe one.

The gratification to be found in the Meetings of the British Association will prevent the possibility of disappointment in the journey, whilst the present

time has the recommendation that the leading railways will grant tickets to Newcastle and back at a single fare, to all who join the British Association.

The following are the railways, etc., which offer the privilege of return tickets at a single fare—

Great Northern Railway Company; London and North-Western Railway Company; Midland Railway Company; North-Eastern Railway Company; Manchester, Sheffield, and Lincolnshire Railway Company; Lancashire and Yorkshire Railway Company; North British Railway Company; Caledonian Railway Company; Edinburgh and Glasgow Railway Company; Scottish Central Railway Company; City of Dublin Steam Packet Company *(viâ Holyhead)*; North Lancashire Steam Navigation Company *(to Fleetwood)*; Belfast Steam Ship Company *(to Liverpool)*; Glasgow and Liverpool Royal Mail Steam Packet Company; Tyne and Continental Steam Packet Company.

Pharmaceutists wishing to avail themselves of these tickets may communicate with Mr. H. B. Brady, 40, Mosley Street, Newcastle-on-Tyne, Local Secretary of the Pharmaceutical Society, and state whether they wish to join the British Association as Members (£1 entrance and £1 annual subscription), or as Associates for the present year (£1 subscription).

They will then receive a voucher to enable them to procure the reduced railway tickets.

A programme of the general arrangements for the Meeting of the British Association, and information as to lodgings, etc., may be had on application by post to the "Local Secretaries of the British Association, Newcastle-on-Tyne."

The Pharmaceutical Conference will probably meet either on Tuesday or Wednesday, September 1 or 2. To enable this and other information to be given, those intending to take part in it will please inform Mr. Brady what is their address whilst staying in Newcastle.

Signed,

J. Abraham, *Liverpool.*
William Ainslie, *Edinburgh.*
J. H. Atherton, *Nottingham.*
John Attfield, *London.*
Samuel Banner, *Liverpool.*
J. B. Barnes, *Cambridge.*
William Bastick, *London.*
Henry Booth, *Rochdale.*
Alexander Bottle, *Dover.*
H. B. Brady, *Newcastle-on-Tyne.*
W. H. Brown, *North Shields.*
Gilbert Knill Cotton, *Barnstaple.*
J. Coupland, *Harrogate.*
H. Deane, *London.*
Arthur Deck, *Cambridge.*
Harry Napier Draper, *Dublin.*
George Edwards, *Dartford.*
J. B. Edwards, *Liverpool.*
Samuel Gale, *London.*
R. W. Giles, *Clifton.*
T. W. Gissing, *Wakefield.*
T. B. Groves, *Weymouth.*
W. Jabez Halliday, *Manchester.*
W. H. Harris, *Northampton.*
T. Harvey, *Leeds.*
A. F. Haselden, *London.*
R. Holden, *York.*
E. Hollier, *Dudley.*
T. J. Howson, *Gateshead.*
Joseph Ince, *London.*
William Jackson, *Crediton.*
John Mawson, *Newcastle-on-Tyne.*
Nathan Mercer, *Liverpool.*
John Palk, *Exeter.*
R. Parkinson, *Bradford.*
John C. Pooley, *Bath.*
B. S. Proctor, *Newcastle-on-Tyne.*
W. B. Randall, *Southampton.*
R. Reynolds, *Leeds.*
F. M. Rimmington, *Bradford.*
J. Robbins, *London.*
W. D. Savage, *Brighton.*
G. F. Schacht, *Clifton.*
F. Sutton, *Norwich.*
T. B. Teasdale, *Darlington.*
John T. Tupholme, *Brighton.*
J. Whitfield, *Scarborough.*
J. Wiggin, *Ipswich.*
W. Wilkinson, *Manchester.*
J. R. Young, *Edinburgh.*

Gentlemen who approve of the Conference, and are willing to aid in promo-

ting its objects, are requested to give in their adhesion, though they may be unable to attend. Communications may be addressed to Dr. Attfield, 17, Bloomsbury Square, W. C., or to Mr. H. B. Brady, Newcastle-on-Tyne.

ORIGINAL AND EXTRACTED ARTICLES.

ACCLIMATIZATION.

BY MR. JOSEPH INCE.

"When a Traveller returneth home, let him not leave the Countries where he hath travelled, altogether behind him, but maintain a Correspondence by Letters with those of his Acquaintance which are of most worth. And let it appear, that he doth not change his Country Manners for those of foreign parts; but only prick in some Flowers of that he hath learned abroad, into the Customs of his own Country."—Lord Bacon.

Part II.—The Garden of Acclimatization (Paris)—concluded.

Owing to the presence of politico-pharmaceutical discussions, these sketches have been compelled to appear in a fragmentary and disconnected manner, a circumstance to be (if possible) avoided; since the reader is no longer able to see at one glance the land that lies before him, and by too frequent recurrence he may grow weary of the subject. It may be recollected that seven plants, to which special attention has been called by the Official Directors of the Garden, were briefly noticed. We now come to the

INDUSTRIAL PLANTS.

1. *Eucalyptus globulus*, from Australia. A tree of rapid growth, ornamental; wood well adapted for use in building. Unfortunately, it can only be cultivated in warm climates, such as the south of France or Algeria; it is too delicate. Independently of its industrial applications, its fine appearance and bluish foliage will make it one of our most attractive garden ornaments. Beauty is use.

2. *Rhamnus utilis*, Loza.* Shrub, which produces the green dye of China, a most hardy plant, and capable of general cultivation.

3. *Acer saccharinum*, sugar-maple or rock-maple of Canada (called *Acer* from the tenacity of its wood; it is the *acre et durum lignum* of Pliny). John Evelyn, in his 'Silva (1664), A Discourse on Forest Trees, with an Historical Account of the Sacredness and Use of Standing Groves,' relates that a portion of the sugar made by the Canadian savages was constantly sent for many years to Rouen, in Normandy, to be refined; besides which, he adds that they made an excellent syrup of Capillaire, which was very useful in scurvy. From the calcination of the maple-wood, four-fifths of all the potash imported from America into Europe are produced. The Maple grows without much difficulty, especially in high districts which are not marshy. A stony and warm soil seems to suit it best; but in all situations it is capable of enduring the severest cold. The leaf, of a delicate green in spring, changes to purple-red in autumn, and is a striking object in the sunlight. The wood of the

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* Loza. With regard to those subjects which would suffer by being imperfectly reported, only such memoranda have been given as would serve to mark their place in a descriptive catalogue. An abstract of the acclimatization and industrial applications of the silkworm would require the space of one number of this journal; an account of the discussion relative to the green dye of China would require another. (*Vide* Pharm. Journ. old series, vol. xvi. pp. 517, 553; new series, vol. i. p. 228. A Residence among the Chinese. Robert Fortune, p. 164.)

Sugar-Maple (called by the Canadian-French *Bois franc*) is of great use in domestic purposes, specially for the wheelwright and in the construction of the instruments of husbandry. It is even sometimes prefered to Oak in cabinet-work, as being equally hard, easier to work, and less expensive; it moreover takes an excellent polish. The Sugar-Maple is the favourite tree of the Canadians, and figures in the national arms. The sugar is worth in France about sixpence a pound; in Canada and in the Colonies from ninepence to tenpence a pound. One tree produces generally one pound, but the yield is greater when the Maple is exposed to the sun. In Canada the plantations are let out to peasants, and whole forests of this tree belong to the Crown lands. The sugar is obtained by making a deep incision at the base of each tree, a fit receptacle being placed to receive the exuded juice. It is collected in February, or at the beginning of March, although the ground is often still covered with snow. A cold dry winter is much more advantageous than a wet, variable season. On a bright sunshiny day, after a night's frost, the juice flows more abundantly, and a tree sometimes produces as much as from two to three gallons. The time during which the juice exudes is about six weeks, precisely at the period when agricultural work is least in demand. An eye-witness states that a great evaporating pan is suspended over a quick fire, in the plantation itself. Into this pan is poured the collected juice, the whole being stirred up with a wooden spade.

As soon as it begins to boil it thickens, changes from its whitish colour into yellow, and so rapidly alters in consistence, that it is necessary, as speedily as may be, to transfer it into wooden moulds, in which it sets even before quite cold. By using clay-moulds a very white sugar is obtained, but of much inferior quality, specially with regard to taste. Other accounts state that it is capable of being refined equal to the best white sugar of commerce. Maple-sugar has a slight odour of Vanilla. The whole rustic population of Lower Canada (about 700,000 individuals) use no other. In 1851, the total production was estimated at ten million pounds weight, which amount did not include the sugar consumed by the inhabitants, which had not appeared in the markets. Some young plants have been received direct from Canada, which have succeeded very well; there is therefore every reason to expect a favourable result from its cultivation.

4. *Quercus castaneæfolia*, Oak with Chestnut leaves. A very handsome tree; the leaves being used for the nourishment of the silkworm called *Bombyx Pernyi*.

5. *Rhus vernicifera*, from Japan, which succeeds well in European climates. From it is extracted the true Japan varnish; it is still rare.

6. *Ailanthus glandulosa*. Of late, celebrated on account of its leaves supplying the proper food for the silkworm called *Bombyx Cynthia vera*. Its cultivation seems destined to have important results. This tree was erroneously supposed to yield the Japan varnish, and for this reason it is better known under the title of Japan varnish-tree than by its true name of *Ailanthus*.

7. *Urtica nivea*, a robust, vigorous plant, producing the well-known article called Grass-Cloth.

8. By way of ornament, the magnificent tree *Chamærops excelsa*, the Chinese Palm, has recently been introduced (1861–1862); its cultivation seems hitherto to have been attended with great success. If capable of being thoroughly acclimatized, it will form a most striking feature in our landscape gardening.

For further description of the Garden I must refer the curious to a good Paris handbook, cautioning the reader not to put too implicit confidence in the rose-coloured style of narrative which most French writers find it so diffi-

cult to avoid. The rockery and artificial lake may hereafter be objects of attraction, but at present the less said of them the better. Now it is evident that neither this garden nor any other can afford space to acclimatize the globe; whatever may be its future extension, it simply claims to be a standing witness of, as well as a strong incentive to, what can and should be done elsewhere. To quote the words of M. Rufz de Lavison: "It is a sort of scientific agency, which facilitates the means of procuring proper specimens in the case of all those who desire to make similar experiments, spares them the trouble and saves them from the futile endeavour and lost time which must necessarily occur whenever any one embarks on new researches without former experience and without a guide."

Let us now seek the retirement of the little reading-room, where we shall find books, treatises, and periodicals bearing on acclimatization, and where, sheltered from the glare of the sun without, we may glean something of the private history of a few great acclimatists.*

M. Charles de Montigny belonged to a family which left France during the Revolution; he himself was born in Germany, in the year 1808. At an early age he entered the army, and was aide-de-camp to General Favier during the campaign in Greece. After some time filling a post in the Navy Department, he went in 1843 to China, as attaché of the Embassy, under Monsieur de Lagrénée. On his return he was appointed Consul for France in China, and some years afterwards, when made Consul-General, was sent to Siam, as Minister Plenipotentiary, and there successfully negotiated the treaty of 1856. While in China he devoted what little leisure he had to promoting the acclimatization of several animals, and numerous useful plants, as is sufficiently shown by the many times his name occurs in the Bulletin of the Imperial Society. As a reward for his diplomatic services he was made Commander of the Legion of Honour, and had his health permitted might now have been Minister for France at Pekin. Again, as testimony to his great services rendered in China, the Foreign community resident at Shanghai presented to him a most flattering address on his departure in 1859.

M. Edouard Drouyn de Lhuys was born at Paris, November 19th, 1805. His father was Receiver-General, and some members of his family were distinguished in the army and the magistracy. He studied at the College of Louis le Grand. In 1823 he obtained the first prize in Rhetoric. After having gone through the routine of the School of Law, he entered on the career of diplomacy, and from 1830 to 1840 was successively Attaché of the Embassy at Madrid, Chargé d'Affaires at Lahaye, and finally Chief Secretary at Madrid. In 1840 he was Minister for Foreign Affairs in the department of Commerce. In 1842 he entered the House, and from that time he has been distinguished in the political world. In addition to his strong bias for a public life, M. Drouyn de Lhuys has always shown a marked predilection for agriculture; he was one of the first to follow in the footsteps of Isidore Geoffroy Saint-Hilaire, and forms a living example of how well the man of the world may blend with the man of science.

Baron James de Rothschild, the fifth and last survivor of the sons of Meyer Rothschild, the founder of the house of that celebrated name. He was born at Frankfort in 1792, and established himself in Paris in 1812. Some years afterwards the Emperor of Austria gave him the title of Consul-General of the Empire in France, which title he has always since retained. After the Resto-

* "As for the Acquaintance which is to be sought in Travel, that which is most of all profitable, is Acquaintance with the Secretaries and employed Men of Ambassadors; for so in travelling in one Country, he shall suck the experience of many. Let him also see and visit eminent Persons, in all kinds, which are of great Name abroad, that he may be able to tell how the Life agreeth with the Fame."—*Lord Bacon.*

ration, he was famed for his portentous loans. The Baron is Grand Cross of the Legion of Honour, and it is needless perhaps to say that he is decorated with many foreign orders. The aid of such a man is most desirable, and his great influence has been uniformly employed in behalf of this and kindred associations.

It would be unjust to pass over the name of *Count D'Eprémesnil*, who is a thoroughly scientific cultivator, as well as an indefatigable promoter of every branch of acclimatization; he is at present General Secretary.

M. Moquin-Tandon (Horace-Bénédict-Alfred Moquin-Tandon), one of the most distinguished *savans* in France. He was born at Montpellier (Hérault), May 7th, 1804, studied Natural Science under Duval and Auguste de Saint-Hilaire, was made Docteur-ès-Sciences at 22, M.D. two years later, and occupied successively the Chair of Physiology at Marseilles, and that of Botany at Toulouse. For twelve years he was Secretary of the Faculty of Sciences at Toulouse, and was for three years Dean. At the same time he had the direction of the Garden of Plants in that city, where he exercised his functions for the long space of twenty years. In 1850 he was sent on a Government expedition to Corsica, after which he published the 'Flora of Corsica.' In 1853 he succeeded to Richard as Professor of Natural History of the Faculty of Medicine in Paris; soon afterwards he became Director of *the* Jardin des Plantes—the ensuing year he was elected to the Institute: he has been Member of the Legion of Honour since 1843. M. Moquin-Tandon has specially devoted himself to Botany. His published works are numerous; in 1860 appeared his 'Elements of Medical Zoology,' and 'Elements of Medical Botany.' To him has been paid the graceful compliment that he is as much distinguished for his agreeable manner as for his severe and technical erudition.*

M. Guérin-Méneville (Félix-Édouard) was born at Toulon, October 10th, 1799. He has devoted himself through life to the study of Natural History, and has lately been distinguished for his introduction and cultivation of the silkworm; he has written many elaborate papers on the subject. He has from time to time been sent by the Government on scientific expeditions, particularly to Algeria. He has laboured, often successfully, to destroy the disease that is so fatal to the silkworm, on which point he has submitted various theories and practical suggestions; some of his recommendations have been already carried out. A mere paragraph will scarcely convey the great commercial value of such speculations.

* Since the above was in type—"The sudden death of Professor Moquin-Tandon is announced. His death resulted from disease of the heart. He had for some time past suffered from symptoms of cardiac disease; but he shunned auscultation, and would not even allow his pulse to be felt. On the Monday, he was, as usual, in his place at the Institute; and on Tuesday, after presenting a paper at the Academy of Medicine, passed the evening with an illustrious and *savant* General, and returned home in his usual health. He had scarcely fallen asleep when he was awakened by a pain in the region of the heart, and then suddenly expired. M. Moquin-Tandon was fifty-nine years of age. He succeeded Achille Richard in the Chair of Botany and Natural History at the Faculty of Medicine of Paris, and was member of the Institute and of the Academy of Medicine. At the time of his death he was engaged in finishing a work on which he had bestowed much pains,—'The Natural History of the Sea,' which will be shortly published. M. Moquin-Tandon was not alone a man of science; he was distinguished for his literary abilities, and by his affability; and the charm of his wit had gained for himself the hearts of very many friends. Consequently, as we read, an immense assembly attended his funeral. The Academy of Medicine, the Faculty of Medicine, the Zoological Society, the Society for the Protection of Animals, and many other charitable societies, were represented by deputation. He left a distinct order that no oration should be given over his grave. The eloquent voice of M. Coquerel, minister of the reformed religion, was alone heard in the cemetery. M. Coquerel dwelt especially on the eminently religious character of the deceased, and showed that, amidst all his scientific labours, M. Moquin-Tandon had found time to write in defence of his religion—the reformed."—*British Medical Journal, April* 25, 1833.

Dr. Rufz de Lavison (Étienne), Director of the Garden, was born at Saint-Pierre, Martinique, January 14th, 1806, his family having emigrated from Bordeaux in 1790. He went through his classical studies in Paris at the College of Louis le Grand, and passed his medical career at the School of Medicine (1825), and subsequently distinguished himself much in his various examinations. In consequence of the attention he had already attracted he was sent to investigate the cholera, which then raged at Marseilles. For his skill and courage he received the Cross of the Legion of Honour, being then twenty-eight years old. Just at the moment when success at Paris seemed most certain, he suddenly disappeared, and went back to his family at Martinique. There he was chosen Physician-in-Chief of the Civil Hospital, and other honours followed, when up sprang the Revolution of 1848; physic was thrown (along with society) to the usual Shakespearian receptacle, and M. Rufz de Lavison was elected Mayor and President of the Council. In 1856 he wisely went back to France. Once more he essayed the practice of medicine, but his health no longer allowed him to continue such a laborious pursuit; yet still wishing to be of service, he turned his serious attention to acclimatization—with what success the actual standing of the new Society best will show.

Such are a few of the moving spirits of the Association; the names have been selected chiefly as being those most familiar to the English reader. The great wish of this band of men and of their companions is that every traveller who leaves the shores of France (whatever his special duties) should create himself, as far as may be, an acclimatist,—consul, commercial agent, soldier or civilian, each alike may aid. To this end a series of printed rules have been provided. The official instructions are general and special: the general include the investigation, choice, gathering, exportation, transport, and reception of animals and vegetables, eggs, grains and other products: the special instructions bear reference to each of the great divisions of the globe, being a complete enumeration (corrected to the present date) of animals or vegetables which are deemed useful to acclimatize either at home or in the colonies. Before starting on the journey some preliminary study is recommended, and the traveller is desired to make himself familiar with existing books, maps, charts, and all other available sources of information. If possible, it is further advantageous that he should not be unskilled in the manipulation of ordinary philosophical instruments, bearing in mind always that the Society enlists the co-operation of the humblest observer as well as that of the most scientific naturalist. Moreover, residents in any district are earnestly desired to supply reliable local information.

With regard to vegetables in a state of cultivation, it is recommended to report to what extent they are hardy; of slow or rapid growth; fertile and yielding useful products, or whether they are wild varieties; if so, to ascertain whether they may be capable of culture, and to what extent susceptible of improvement.

The special list includes the following:—

From Scandinavia, the pine; Spain, the cork-tree; Russia, the olive; China, rice, beans, maize, ignames, oaks, wax-tree (*Ligustrum lucidum*), tallow-tree (*Croton lacciferum*), varnish-tree (*Rhus succedanea et vernicifera*), camphor, laurel, etc.; India and Siam, bombyx mylitta, caoutchouc (*Ficus elastica*); Algeria, leeches; Egypt, the Doum palm, cotton-tree, aromatic and medicinal plants; Central Africa, rice, indigo, and laurel; the Cape, the splendid pelargonium; the Pacific Isles, Java rice, the gutta-percha-tree (*Isonandra Percha*); Australia, the caoutchouc-tree (*Ficus rubiginosa*), eucalyptus, and mimosas; Polynesia, the bread-tree, arrowroot, sandal, and rosewood; North America, the castor (Canadian), oaks, maples, nut-trees,

poplars, tulip-trees, willows, and liquidambar, magnolias, rhododendrons, azaleas, and a vast army of trees, vegetables, and flowers, to—say nothing of animals, birds and reptiles (specially the tortoise); Central Africa, the cacao; South America, the tea-plant and cinchona, fuchsia, calceolaria, and passion-flower.

Such is a general outline of the Société du Jardin d'Acclimatation. Thoughtful men of all nations have been keen observers of nature, and in the charmed circle of other thoughtful men they have received the full homage of respect; yet too often the result of their labours has been a new ponderous folio, or a learned abstract, destined to be decently interred in the annals of some privileged society. Books do not teach everybody—there is a class of mind (in itself both highly cultivated and intelligent) to which printed sentences are literally a dead letter. Many a man of great energy, passionately fond of enterprise, daring and successful in commercial speculation, is in himself a walking encyclopædia of general knowledge, and is yet incapable of clothing a single thought in appropriate written language, and hates the printer's devil as orthodox Christians do the father of all evil. Shall we call him uneducated, and ignore his real practical learning? Let us be more sensible, and at the same time more just—*his* literature is action. Now a garden, such as the one described, appeals directly to sympathies like these. Here is a book in Nature-printing, the type of which is never worn, and whose truths present the strange anomaly that they are both ever-changing and everlasting,—a book wherein the most contemplative philosopher and the busiest mortal may delight to read; and it is certainly worth while offering a fair field of study to meet the craving eagerness of many an adventurous spirit, who, though he may scarcely distinguish between an Elzévir and the printing of this Journal, feels himself aggrieved because his merit is sometimes unfavourably contrasted with that of the man who can merely round a period or construct a phrase.

Should it, moreover, be the fortune (good or ill) of any reader of these lines to be engaged on foreign service, he will assuredly thank the writer for having introduced the subject of Acclimatization to his notice. I had a near and dear relative, of most companionable habits, stationed in the Havannah. Often have I listened to his sad recital of the blank routine monotony of that least enviable life. No wonder that in all that colony of disheartened Englishmen there was but one thought,—to make money and retire. How would each homesick resident have welcomed the genial inspiration of the Saint-Hilaires, and have expanded under the grateful influence of a study which brought them once more within the pale of European sympathies!

"Thoughts perish," says the eternal record; well is it, therefore, for the natural philosopher of the present day that his deepest theories may be translated into living and palpable realities; and that while men stumble over books and sentences, he may not only realize his speculations, but present them in a language intelligible to humanity in common.

In 1860, M. E. Roehn thought that the alpaca* was destined to be of essential service; he sent over and acclimatized the animal, and it is now writing its own history (practical and scientific) in the Garden at Paris, in the industrial produce of Australia, in the fabrics of the North of England, in the covering of my umbrella, and in my last tailor's bill. May I commend this great subject specially to Pharmaceutists? may I offer them, even though but as a

* This paper is of course written from a French point of view. I am not ignorant of the English claim to the introduction of the alpaca, nor of the admirable acclimatization experiments of Messrs. Ledger, Wilson, and others. Let us hope that some competent authority will give an account of recent Australian success.

relaxation from their severer studies, a theme so rich in associations and so fertile in results?

Haply a stray, sight-worn English tourist, tired of the theatre and sickened with the glare and glitter of Mabille, may be glad to seek refuge on some quiet autumn morning in the more placid though not less pleasurable scenes of the Jardin d'Acclimatation.

26, *St. George's Place, Hyde Park Corner.*

PROVINCIAL EXAMINATIONS.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Gentlemen,—In this month's Journal there appears a letter from a Registered Apprentice, urging the Society to carry out the views of "Opifex" by way of supplying what he considers *a long-felt want*, viz. Provincial Examinations. He states that many young men will not go to the expense of passing the examinations in London, when the advantages they derive from being connected with the Society are so few, and that the Pharmaceutical Society will lose much of that sympathy which it ought to have from those connected with it, if it does not adapt itself to their wants.

Again, in another part of his letter, he admits that the Society has steadily gained ground, and also requests that we do not sit down in a state of lethargy, when a little exertion on the part of a few would greatly increase our numbers.

Now, gentlemen, I think it will be pretty generally acknowledged that your correspondent, if not lost to the Society, is in a great measure oblivious to the advantages derived from being connected with it, so that it may not be out of place here to mention a few of the more important, viz. the recognition of the Society by the Legislature in the Pharmacy Act, accompanied by the privilege of using a title which implies professional qualification; the exemption of registered Pharmaceutical Chemists from serving on juries; and the restriction of the privilege of service as dispensers in the Army to those who hold the Major Certificate of the Society. Having passed the Society's examination, is the best recommendation to obtain a situation in the best houses in London, more than one of the highest of which will, I believe, take only those assistants who belong to the Society. For the information of your correspondent, it may be as well to inform him that physicians and medical men generally are more interested in the welfare of the Society than he is probably aware of, as the following will sufficiently testify:—A London physician of some note lately wrote a prescription for a lady of good family, residing in the suburbs of town, which was left with her family chemist for preparation. The prescription was for drops, ℥iss, of a sedative nature, and the direction "*Coch. magnum* pro dosi, in aquâ sumenda." The dispenser, observing the dose to be unusually large, had not time to refer to the writer, so, acting on the impulse of the moment, unfortunately diluted the drops to suit the prescribed dose, instead of correcting the error in the directions, which had evidently been made by a slip of the pen. The patient, however, remembering the doctor's instructions, had the prescription immediately made up at another place, and the drops were returned, presenting a very different appearance as compared with the previous prescription, and the teaspoonful dose on the label answering in every respect the physician's instructions. The lady returned the drops first made up to the chemist, with a request that the family account be sent in instanter; and on his communicating with the physician to give an explanation, received a reply to the effect that the character of the medicine ought not to have been altered without referring to the writer, and that his prescriptions for that family were only intended to be made

up there until he had found out the nearest Pharmaceutical chemist, as he always recommended one of that body.

I quite agree with your correspondent that some chemists in the country do not give preference to young men for assistants belonging to the Society, but the reason is obvious; their businesses consist principally, besides retailing a few drugs, and cultivating inorganic chemistry, of selling oils, paints, cigars, a varied assortment of fancy pipes, light wines, and even in some instances bottled beer, and in such cases a certain amount of trade sharpness is more requisite than a knowledge of the nature of medicines. On reflection, I think there can be no doubt but that the question of establishing provincial examinations at present is premature, and quite uncalled for, when the examinations are held in London ten times in the year, and conducted by a board of examiners selected on account of their special qualifications, each one taking a special department, and where the candidate may rely upon having a fair and impartial examination. We have also in Bloomsbury Square an excellent library, and a museum containing an admirable collection of animal and vegetable products from every part of the world, arranged for the convenience of systematic study, and it would be quite impossible that the arrangements for conducting the examinations in the provinces could be carried out with the same amount of precision as in London.

The Society having steadily gained ground is a sufficient proof that it has already adapted itself to the wants of the profession. It cannot however be supposed that men of long standing in business, however well qualified, will submit themselves to the examination test; but it is most important to the youthful candidates connected with the Society, for their own future benefit, that they should adapt themselves to its requirements. What books to read and a certain course of study have from time to time been laid down in these pages; and I think few young men, after preparing themselves for the examinations will scruple at the trifling expense of a journey to London to obtain the desired object. I have frequently heard candidates complain of the stringency of the examinations, or rather of the work in preparing for them, but never heard a murmur concerning the expense of passing them.

I remain, yours faithfully,
A MAJOR ASSOCIATE.

Windermere, July 18, 1863.

THE PROPOSED NEW MEDICAL ACT.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—From the tone of some of the chemical journals, it appears probable that a violent opposition to the Act will be instituted by chemists and druggists. Surely no chemist can object to the preamble of the Bill:—" Whereas it is expedient that persons requiring medical aid should be enabled to distinguish qualified from unqualified practitioners; and whereas it is moreover necessary for the safety and protection of the public towards securing adequately educated practitioners in the several departments of medicine, surgery, and pharmacy, be it therefore enacted," etc. etc.

If so expedient, why offer resistance? Given the security of existing rights, a necessary preliminary to legislation, will it not be a great advance to prevent in future irregular and unqualified persons from practising in Pharmacy? To oppose the Act will be shortsighted policy. The Medical Council deserve commendation for taking up the question. Both medical men and the public are justified in applying to Government that medicine should be dispensed by qualified practitioners, surely of equal moment to the physician and the patient. If the registration of proprietary medicines, as proposed in sec. 57, does away with the

vexatious Medicine Stamp Act and the visits of Inland Revenue informers, and will permit a proper label to be affixed to medicines, giving necessary information to the public, which under the present system cannot be effected, I see no objection to the clause, understanding that the sale of medicines already known will not be interfered with.

A short time ago I had occasion to make inquiry respecting the admission of medicines to Russia. I enclose the regulation.

Extrait du Tarif Géneral des Douanes de l'Empire de Russie, de l'année 1857, page xvi. § 4.

"§ 4. Pour l'admission des substances pharmaceutiques ou médicaments préparés inconnus, ou bien déjà connus mais non dénommés dans ce tableau, il est de rigueur qu'un échantillon soit présenté au Département du Commerce extérieur, lequel en référera aux autorités compétentes pour les affaires de la médecine, afin que le dit échantillon soit assimilé à l'article du présent tableau qui a la plus d'analogie avec l'échantillon."

I am, Sir,
Yours respectfully,
WM. JABEZ HALLIDAY.

65, *Bury New Road, Manchester.*

THE ERROR AND THE REMEDY.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—As an old member of the Pharmaceutical Society, I ask permission to occupy some of your space; and I write on a subject which claims attention not only from Pharmaceutical Chemists, but from the trade in general. That to which I wish to draw the attention of your readers is (1) the lamentable failure of our Society to accomplish the objects for which it was founded; and (2) to offer some hints for improvement.

We see from the July number of our Journal, after an existence of nearly twenty years, how very small a proportion Pharmaceutical Chemists bear to Druggists in general. We see that outsiders are quite shut out; and we have the experience that our legislators will not allow of any exclusive legislation by which an examination will be made compulsory, which is far beyond the present attainments of the bulk of those interested, and the majority of whom are well able to conduct their several businesses. Let us seek to find out wherein we err, and what is the remedy; and as in the multitude of counsel there is wisdom, I venture to make the following hints:—It appears to me we have aimed a great deal too high all at once, and have quite overshot our mark. What is really required is, that none should be allowed to practise pharmacy who have not a good practical knowledge of the drugs they deal in, and of the language in which prescriptions are written. But what we try to obtain is, a theoretical knowledge of many other things besides, and that from a body of youths and men who have positively nothing but honour to gain from their toil and outlay; for, so far as my experience goes, non-members are equally successful in business, and non-associates or assistants, as their conforming brethren. Indeed, I am not by any means sure that I should consider association with our Society any recommendation to an assistant. I would much rather take one from a good house of business than from the Pharmaceutical Laboratory, and I know such a feeling is very general in the trade, especially where anything like an extensive country business is done. And then the advantages which we as members gain in exemption from service on juries, is really one in which all

druggists will be found practically to share, as no judge will henceforth fine one who pleads the exigencies of the drug trade as a plea for non-attendance.

I consider our Society much too hard to enter, and when in, that it gives too small an advantage to its members. It is true we have the Journal for our guinea per annum, but that is all; for so far as I can see, those in Weymouth who are non-members are not one whit behind members in public estimation; and our very right to the title depends on the continuance of our guinea subscription.

I think the great and fundamental error we have committed is in trying to obtain a full-fledged, vigorous Society all at once, instead of letting it grow naturally, and we have only got as our result an abortion, a hothouse plant, which has no principle of self-sustainment, and which cannot bear the roughs and realities of life. I don't object to the looking forward, by-and-by, to even more stringent requirements than we have at present, but the thing must grow, —not be manufactured. At present we must try back, and what I would suggest is as follows:—

1st. That a new Act be obtained, making membership compulsory, and recognizing two grades:—(1) Members of the Pharmaceutical Society; (2) Masters in Pharmacy.

2nd. That all druggists at present in business, and their assistants who have actually served an apprenticeship, be invited to have their names enrolled—gratuitously—as Members, merely charging the certificate; and that all existing Pharmaceutists, or perhaps only those by examination, be enrolled as Masters.

3rd. That only a small subscription, say, 10s., be required annually from each Member, and that the gratuitous supply of the Journal be discontinued.

4th. That admission to the Society should in future recognize especially apprenticeship, a knowledge of English, Latin, and of the properties and doses of drugs. The examination might be gradually made more stringent, and an altogether higher examination provided for Mastership.

I think these would be sufficient, and be such as we might attain, as all existing druggists and their assistants would hail such a step; and then the Society having once a good root and a real useful existence, its growth would be natural, not artificial or forced; while the Journal itself would greatly improve under healthy competition. For myself I can safely say, I get far more practical hints from the 'Chemist' than I do from our own Journal. I could mention several things from the former by which I save pounds per annum, but I cannot think of a single hint in the 'Pharmaceutical' which has been of the least use to me in my business.

I throw out these hints for the purpose of ventilating the subject, and would suggest that druggists and their assistants all over the kingdom be invited to meet and discuss the matter, we in the meantime furnishing them with all the information we can on the subject; and that afterwards a series of meetings be held in London, composed of delegates from the local meetings, where the matter might be fully discussed and such steps taken as would bring our views prominently before the legislature.

I am, Sir, yours obediently,

Weymouth, July 6, 1863. THOMAS BARLING.

PROFESSIONAL COURTESY.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—Will you allow me a short space to call attention to what I consider a great want of courtesy and liberality on the part of one member of our profes-

sion to another, and also to give a little information which perhaps may prevent any one else being similarly circumstanced.

I have no intention to cause the least annoyance or to hurt the feelings of any one, therefore I shall mention no names, hoping it may have the desired effect without.

One day last week one of my customers brought me the following prescription to be dispensed:—

℞ Elixir Vitriol. Aromat. (Mynsich.) ʒj.
Tinct. Cascarillæ ℥ij. M.ft. guttæ.

with the remark that "I was to be very particular in reference to the first preparation, and, in case I had none, I could obtain it at ——." Well, Sir, wishing to be conscientious, and as I never allow a prescription to be prepared under any doubt or uncertainty, I sent to the establishment named for some, but was flatly refused it, and an answer returned that "if I chose to send the prescription, it would be dispensed." Now, Sir, at this I have no reason to grumble or complain, every one having the right to carry on their business as they may think proper; so, not being able to help myself, like many others I made a virtue of a necessity, and the next morning sent the prescription (with a printed order, that there might be no mistake) to be dispensed. But, Sir, what I do complain of is this, viz. that the prescription was returned bearing the stamp of the establishment. You may imagine my astonishment, Sir; it is so great that I will not trust myself to make any comments, but leave you and the profession to form your own opinions. I had innocently imagined that the world was large enough for us all, but I suppose I have been deceiving myself. For the benefit of those who may not know what preparation is intended, I will just add that the Elixir Vitriol. Aromat. Mynsich. is identical with the Acid. Sulph. Arom. of the Edinburgh and Dublin Pharmacopœias.

I am, Sir, yours obediently,
B. M. JOHNSON.

70, Tottenham Court Road.

A NEW INDEX FOR REGISTERING THERMOMETERS.

We have received the following notice from Mr. W. Symons:—

Maximum registering thermometers are generally made on Rutherford's plan, with an index, which is pushed before the mercury and left at the point of greatest expansion. Steel has been usually used for the purpose, but it is liable to rust and has other defects. Other substances have been suggested, and perhaps none with more success than graphite; but this body sometimes contains impurities, which appear to affect the mercury and thus disarranges the instrument. Other ingenious methods of registering have been suggested, two of which are well known and much used by meteorologists, but these are not altogether free from objection, and at least, for popular use, a cheap day-thermometer with a perfect index has been a desideratum. Mr. Symons, some of whose instruments have been previously noticed in the 'Pharmaceutical Journal,' has for some time been experimenting on the subject, and thinks he has now succeeded in introducing an index, which he calls "Lithite," free from the usual objections. It has stood every test that can be applied, and the thermometers are now in the hands of many observers.

REPORT OF THE RESULTS OF PHYSICAL AND CHEMICAL INVESTIGATIONS, AND OF THE APPLICATIONS OF PHYSICS AND CHEMISTRY IN THE ARTS.

Aniline Blue.—This substance is produced by heating rosaniline with an excess of aniline; torrents of ammonia are evolved, and this magnificent blue developed. The process has been patented in this country by MM. De Laire and Girard, and has been very successfully worked by Mr. E. C. Nicholson, who has succeeded in obtaining a perfectly pure specimen of aniline blue. This has been submitted to investigation by Dr. Hofmann, and the results were announced at a recent meeting of the Chemical Society. Dr. Hofmann finds that aniline blue is produced from rosaniline by the substitution of three atoms of phenyl for three atoms of hydrogen.

It will be remembered that rosaniline, that is to say the base of magenta, has the composition $C_{20}H_{19}N_3, H_2O$.*

Aniline blue therefore is represented by the formula—

$$C_{20}\left\{\begin{matrix} H_{16} \\ (C_6H_5)_3 \end{matrix}\right\} N_3, H_2O,$$

and must be named *triphenylated rosaniline.* Its production is represented by the following equation:—

$$\underbrace{C_{20}H_{19}N_3, H_2O}_{\text{Rosaniline.}} + 3\underbrace{(C_6H_7N)}_{\text{Aniline.}} = \underbrace{C_{20}\left\{\begin{matrix} H_{16} \\ (C_6H_5)_3 \end{matrix}\right\} N_3, H_2O}_{\text{"Aniline Blue."}} + 3NH_3$$

On the Production of Magenta.—Dr. Hofmann, who has already thrown so much light upon the nature and constitution of the coloured derivatives of aniline, has quite recently communicated to the French Academy a most startling fact in connection with this subject.

Having, by analogical reasoning, been led to suspect the existence of two isomeric varieties of aniline, this distinguished investigator sought to compare accurately together specimens of aniline obtained by different processes. Aniline obtained by the distillation of indigo with potash was first examined. The base thus obtained boiled at 182°, and possessed the general characters attributed to aniline. Upon submitting it, however, to the action of chloride of mercury or chloride of tin, or arsenic acid, *no red colour could be obtained.* The aniline obtained from benzol was next examined.

The benzol employed was obtained by two different processes:—1st. By the distillation of benzoic acid with lime. 2nd. By the fractional distillation and freezing of the benzol from coal-tar. The two specimens of aniline prepared from these two samples of benzol each boiled at 182°, and presented all the indications of perfect purity and identity; but when submitted to the action of arsenic acid, or the other oxidizing agents, *they failed to yield any magenta.*

Upon communicating this curious result to Mr. Nicholson, Dr. Hofmann learnt that the fact was already known to the manufacturer, and received several litres of absolutely pure aniline, boiling at 182°, which had been obtained from coal-tar, and which was perfectly incapable of yielding any aniline-red.

An examination of a large number of samples of commercial aniline, obtained from different manufacturers, showed that, while capable of readily furnishing colour by the ordinary means, they all possessed a boiling point above the normal degree, ranging between 180° and 220°. It became obvious therefore that commercial aniline contains some other substance, the co-operation of which is essential to the production of magenta. The fractional distillation of large quantities of this product being a long and troublesome operation, Dr. Hofmann determined first to examine the action of the salts of mercury, tin, etc., upon the homologues of aniline, of which he happened happily to possess pure specimens. The next term in the series, namely, *toluidine*, first engaged his attention. Of the presence of toluidine in commercial aniline there could be no doubt, and Mr. Nicholson was already strongly inclined to regard it as the true source of magenta.

* $C=12$; $O=16$.

Upon submitting an absolutely pure specimen of toluidine, however, to the agents already named, under the most varied circumstances, no trace of colour could be obtained.

A happy experiment served to clear away the obscurity which was seemingly thickening round this question.

Upon treating *a mixture of pure aniline and pure toluidine* with arsenic acid or the other oxidizing agents, an abundance of magnificent colour was instantly obtained. It thus became manifest that the production of magenta depends upon the co-operation of both bases. Dr. Hofmann is still engaged in working out the consequences of this discovery.

On some Metallic Combinations of Aniline.—M. Hugo Schiff has presented to the French Academy an account of a series of compounds, formed by the union of aniline with metallic salts, which tend to thrown an additional light on the formation of magenta or rosaniline. Representing aniline ($C_{12}H_7N$) as ammonia, in which one atom of hydrogen is replaced by phenyl—

$$N\left\{\begin{matrix} C_{12}H_5 \\ H \\ H \end{matrix}\right.$$

these compounds, according to M. Schiff, are salts of a series of *metal-anilines;* a second atom of hydrogen in the ammonia being replaced by a metal. Thus, aniline combined with a salt of zinc forms a salt of *zincanile*, having the composition—

$$C_{12}H_6ZnN = N\left\{\begin{matrix} C_{12}H_5 \\ Zn \\ H \end{matrix}\right.$$

The hydrochlorate of zincanile ($C_{12}H_6ZnN, HCl$) crystallizes in oblique rhomboidal prisms, free from water, and soluble in water and alcohol, especially when heated. By a prolonged boiling of these solutions the salt is decomposed into aniline and chloride of zinc. It combines with bichloride of platinum, forming granular crystals. The hydrobromate and the hydriodate resemble the hydrochlorate.

The sulphate ($C_{12}H_7ZnN, SO_4$) is more soluble than the preceding salts, which may be prepared from it by double decomposition. Aniline is added to a solution of sulphate of zinc, diluted with water to such an extent as to keep everything in solution; then, on adding a concentrated solution of chloride, bromide, or iodide of potassium, colourless crystals of the corresponding salts separate out.

The salts of *cadmianile*

$$C_{12}H_6CdN = N\left\{\begin{matrix} C_{12}H_5 \\ Cd \\ H \end{matrix}\right.$$

are obtained in the same manner as the salts of zincanile, and possess the same chemical and physical properties. Neither the one nor the other are decomposed by dilute acids in the cold, and even at the boiling temperature decomposition proceeds very slowly.

The *cupranile*

$$C_{12}H_6CuN = N\left\{\begin{matrix} C_{12}H_5 \\ Cu \\ H \end{matrix}\right.$$

forms compounds very little soluble in cold water, and which are decomposed easily by luke-warm water.

Tin furnishes two aniline compounds:—*Stannosanile,*

$$C_{12}H_6SnN = N\left\{\begin{matrix} C_{12}H_5 \\ Sn \\ H \end{matrix}\right.$$

a monoatomic (Sn=58) base, corresponding to stannous compounds; and *stannicanile,*

$$C_{24}H_{12}Sn''N_2 = N_2\left\{\begin{matrix} 2\,C_{12}H_5 \\ Sn'' \\ 2\,H \end{matrix}\right.$$

a diatomic base, corresponding to stannic compounds.

The *hydrochlorate of stannosanile* ($C_{12}H_6SnN, HCl$) is obtained by mixing equal equi-

valents of stannous chloride and aniline; combination occurs with a gentle disengagement of heat, and at the end of several hours a crystalline mass is obtained, slightly soluble in cold water and in alcohol, but which is decomposed by warm liquids.

The *hydrochlorate of stannicanile* ($C_{24}H_{12}SnN_2, 2HCl$) results from the union of two equivalents of aniline, and one of stannic chloride. An intense heat is produced at the moment of admixture, and it is necessary, to avoid explosions, to surround the vessel by a freezing mixture. Under these conditions a perfectly white crystalline mass is obtained. A more advantageous method however may be employed, depending on the curious property of certain metallic perchlorides of dissolving in benzol. If aniline be added drop by drop to a solution of perchloride of tin in benzol, a white crystalline powder is soon deposited, consisting of the hydrochlorate of stannicanile, which is insoluble in benzol. Water decomposes this salt, precipitating stannic hydrate. It can only be fused in very small quantities without decomposition. When some quantity is heated it undergoes a transformation, giving rise to the production of rosaniline (magenta). M. Schiff considers that in the manufacture of this dye, by the action of chloride of tin on aniline, this compound is always first formed. He finds that during the production of rosaniline by the decomposition of the hydrochlorate of stannicanile, the tin is reduced to stannous chloride, a certain quantity of aniline is set free, and a considerable quantity of a white sublimate is produced, consisting of a mixture of the hydrochlorates of aniline and ammonia. He represents the change therefore as consisting of 10 equivalents of hydrochlorate of stannicanile breaking up into 3 equivalents of hydrochlorate of rosaniline, 6 of hydrochlorate of aniline, 1 of sal-ammoniac, 4 of free aniline, and 10 of stannous chloride. At the same time, he allows that in the manufacturing process other secondary products are formed.

He states that perfectly dry hydrochlorate of stannicanile yields magenta when heated in a current of carbonic acid, rigorously deprived of oxygen and moisture; thus proving that neither water nor oxygen are concerned in the reaction, as some have supposed.

On the Reduction of Chloride of Silver.—MM. Millon and Commaille have communicated to the French Academy an extremely elegant reaction, by which absolutely pure metallic silver may be precipitated from its ammoniacal combinations, with all the accuracy necessary for rigid analysis, and in such a fine state of division as to render it available in the arts.

The reagent employed is ammonio-subchloride of copper. When this substance is added to ammonio-nitrate or ammonio-chloride of silver, the whole of the silver is at once thrown down in the metallic state as a grey amorphous precipitate. The precipitate readily assumes a metallic lustre under the burnisher, and may be applied to the surfaces of wood, stone, etc. The reaction takes place so perfectly, that it may be employed either for the estimation of silver, or for the analysis of a mixture of sub- and protosalt of copper; every atom of silver thrown down representing one atom of subchloride of copper.

It is however especially valuable for reducing the chloride of silver residues of the laboratory. These are dissolved in ammonia, and the ammoniacal subchloride of copper added, when the metallic silver is at once obtained in a state of absolute purity. Moreover, it is only necessary to digest the filtrate with a little powdered zinc in a closed flask, in order to again reduce the copper salt, and it is ready for a fresh operation. In this way, the same quantity of copper solution suffices for an indefinite number of precipitations.

On the Preparation of Acetic Anhydride.—M. H. Gal has pointed out that when chloride of acetyl is treated with a metallic oxide decomposition occurs, a chloride of the metal and acetic anhydride being formed. When the chloride of acetyl is poured on finely pulverized caustic lime, the reaction is very energetic; the lime becoming incandescent when considerable quantities are employed. With oxide of lead, on the other hand, the action is very sluggish; but with caustic baryta it is rapid, and at the same time very manageable. If equal equivalents of chloride of acetyle and caustic baryta are sealed up in a tube, the action commences in the cold, and may be completed by a few hours' digestion in a water-bath. Upon afterwards distilling the contents of the tube, the temperature rapidly rises to 137°, and then remains stationary. The liquid which then passes over consists of anhydrous acetic acid. The following equation represents the change which occurs:—

$$C_4H_3O_2Cl + BaO = C_4H_3O_3 + BaCl.$$

Benzoic anhydride may be obtained from chloride of benzoyl by the same reaction. A temperature of 140° to 180° being necessary for twenty hours.

REPORT ON THE BARK AND LEAVES OF *CHINCHONA SUCCIRUBRA* GROWN IN INDIA.

BY J. E. HOWARD, ESQ.

To the Under-Secretary of State for India.

Sir,—I have the pleasure of reporting that the specimens of Chinchona bark and wood, together with dried leaves and decoction made from the same, reached me in good order on the 23rd of May last, and that I have since submitted them to careful examination.

The appearance of the bark indicates that it has been gathered and dried under favourable circumstances. It is full of sap, which, in some cases, exudes a little at the cut ends, and forms what is called a resinous ring or circle. The specific gravity is considerable, and the thickness, especially of the fifteen months old bark, is remarkable for the time of growth, being about one-tenth of an inch in some of the quills, which curl much in upon themselves in drying. The external surface is warty, and the colour more of a tea-green than is usual in the bark as it is imported from South America; but, as it is not cut there at so early a stage of growth, it is difficult to form an accurate comparison in this respect. The taste is that of "red bark," being compounded of the bitter of the alkaloids and the more nauseous taste of kinovic acid. The powder resembles that of good Peruvian bark.

In order to make the best analysis of the small quantity of bark at my command, I commenced with 500 grains of that of the second year's growth, and was able to obtain therefrom a first and second crystallization of white sulphate of quinine. By thus specifying the whiteness, I mean to imply that the bark had not the commercial disadvantage which frequently attends the "red bark" at a more mature stage of growth, resulting from the fact that the colouring matter has in these last become so much implicated with the alkaloids as to make the task of purification a difficult one. The crystallisations I obtained were mixed with some sulphate of chinchonidine, which is commercially (but not medicinally) a disadvantage, and one which always attends the products of "red bark." I also obtained chinchonine and other usual products of the process as from South American bark, viz. kinovic acid, kinate of lime, gum, chinchona red, etc. The product of alkaloid in a rough state was estimated at 4·30 per cent. A second trial of the same quantity enabled me to decide more accurately the percentage product in *purified* alkaloids. I found the total contents 3·30 to 3·40 per cent., and of this (soluble in ether) Quinine and some Chinchonidine, 2·40 per cent., leaving ·60 per cent. of Chinchonine, which crystallized freely, and also ·30 or ·40 loss, chiefly in water of the hydrated alkaloids. This result must be considered extremely favourable.

I have noticed the product of some fine quills of South American red bark as 3·60 per cent.,* the larger bark of the same parcel producing 3·91 of alkaloid. Dr. Riegel obtained from one ounce red bark, the best quality, 4·16 per cent. by Rabourdin's process, or 3·90 by that of Buchner. Of this 2·65 per cent., soluble in ether, was reckoned as Quinine, and the rest was set down as Chinchonine.† I have obtained a much higher percentage of alkaloid from large and peculiarly fine "red bark," but I see no reason to doubt that even this higher percentage would be attained in the East Indies, if time were allowed for the growth.

The exact period at which it would be advisable to cut the bark must be ascertained by experiment; but I think this should take place as soon as the bark attains to a thickness which would repay the cultivation. There would be positive disadvantage in allowing the bark to attain such an age as is indicated by many of the specimens from South America, if the object to be attained is the extraction of the alkaloids; since there

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* 'Illustrations of Nueva Quinologia,' under head *C. succirubra*, p. 15.

† 'Pharm. Central-blatt,' for July, 1852.

is a continual process of deterioration* of these after a certain period of the history of he bark, which is connected with the oxidation of the red colouring matter, and the production, in very old trees, of those fine descriptions of bright red bark which command indeed a high price in the market (as much at the present time as eight shillings per pound), but which would not, in many cases, be more valuable for the production of Quinine than bark of one year's growth.

I next examined the younger bark of one year's growth, taking care to select the most mature portion, and found that it yielded 2·59 of alkaloid, of which 2·55 (soluble in ether) appeared to be Quinine and Chinchonidine, and in part crystallized into tolerably white sulphate, which showed perhaps a rather larger proportion of Chinchonidine than in the older bark. On the other hand, the proportion of Chinchonine seemed notably less, viz. only 0·04 per cent.; but it is possible that the separation was not exactly effected between the Chinchonine and Chinchonidine, which is not easily accomplished by ether in such small portions.

The above result induced me to pay further attention to the leaves, concerning which the absence of any carmine sublimate by heat led me at first to an unfavourable conclusion. The decoctions and infusions made by Mr. M'Ivor, though in perfectly good condition, showed that the contents changed most rapidly under the influence of the oxygen of the atmosphere as soon as ammonia was added to the, at first, decidedly acid liquor. Fortunately, a good supply of several ounces of dried leaves had been sent over, and from these I succeeded in obtaining Quinine, though in very small quantity, but presenting its usual characteristics, dissolving in acids and precipitated by alkalis as a whitish hydrate, soluble in ether, and left by this on evaporation as a resinous-looking body, having the usual bitter taste, also crystallizing not only as a sulphate, but as an oxalate of Quinine (the latter being the more critical test); but nevertheless presenting a characteristic implication with resinous or extractive matter, such as is usually met with in the very smallest quills or *canutillos* of South American bark, in analysing which it is frequently difficult to purify the Quinine from this adhesion. I obtained first from these leaves to the extent of 0·11 of alkaloid, of which part was soluble in ether, the remainder in spirits of wine, and afterwards 0·19 of precipitate still more combined with astringent matter. From these data, it seems to follow that the leaves will not supply a material for the extraction of Quinine, but that they will, nevertheless, be very useful when used fresh or in recently prepared decoction or infusion for the cure of the fevers of the country. To this end, the abundance of kinovic acid they contain, equal (weighed in the rough state) to 4·20 per cent., may also conduce.

I have not much to remark as to the No. 3 (bark renewed over spaces previously cut), as the quantity sent was too small for much chemical examination, but I obtained abundantly by heat the crimson sublimate which marks the presence of alkaloids, and the promise from the external characteristics was good. The No. 4 (bark covered up with moss for some months) seems to me a successful experiment of Mr. M'Ivor's, especially since I notice very abundantly in this bark the crystals of kinovate of Quinine, which I have described† as I found them in the "red bark" of South America, and now find again, quite as plentifully, in the older bark sent from India. I may add that generally speaking, the structure of the barks, as shown by the microscope, makes it evident that the plants had grown vigorously and under circumstances favourable to their full development.

I reserve any opinion as to the best method of drying the bark, to which Mr. M'Ivor alludes, till I have had the opportunity of examining further specimens.

I have the honour to be, Sir, your obedient servant,

June, 1863.

JOHN ELIOT HOWARD.

QUININE, CHINCHONIDINE, AND CHINCHONINE, IN THE LEAVES OF *CHINCHONA SUCCIRUBRA*.

A few remarks of a technically scientific nature on some points which struck my attention in making the investigation detailed in my official report on the red bark grown in South India, may not be unacceptable. The discovery of Quinine, Chinchonidine,

* Described in my 'Illustrations of Nueva Quinologia,' under head *C. succirubra*, p. 14.
† 'Illustrations of Nueva Quinologia,' Mic. Obs., p. 7.

and Chinchonine, in the leaves of the *Chinchona*, seems to confirm the views which I have expressed as to the production of the alkaloids by a reaction taking place between the mother-substance found in the heart-wood and carried up into the leaves by the circulation of the sap, and the ammonia which, according to the observations of De Vry, is present in every part of the plant. This mother-substance, forming a yellow solution in ether, separates in a flocculent mass by the addition of quinine, and the semicrystallization thus induced formed on recrystallization the crystals which I have described and figured as similar to those found *in situ* in the bark itself. The Chinchona-red appears to be formed at the same time, and colours the flocculent mass reddish, or rather pink. I find in the leaves abundance of kinovic acid, which, separated from adherent chlorophyll, becomes perfectly white and similar to that obtained from the bark; they also yield much wax and kinate of lime, together with gum. In order to check or confirm the trial of the leaves, I also examined with similar results the hollow square stalks (received, with other parts of the tree, from Ecuador) just below the insertions of the leaves. This gave a similar but rather less minute quantity of quinine, and also of an alkaloid not soluble in ether. I conclude that the process of the formation of the quinine goes forward still in the bark, though begun in the leaves, and continues to increase with the increasing maturity of the bark, undergoing afterwards the deterioration above spoken of. If such be at all the process, the alkaloids must be found in the sap itself; and if the quinine be formed in the leaves, in which there are certainly no liber-fibres, it seems to me to dispose of the hypothesis that these latter are in some way *essential* to the formation of the alkaloids. The above discovery also coincides with the presence of quinine (as I have shown) very eminently in the cellular tissue of the outer bark, which is evidently, in the barks under consideration, gorged to repletion with sap. Reserving any remarks on the microscopic peculiarities in these East Indian barks for some further occasion, I remain, yours, etc.—John Eliot Howard. (*From the Journal of Botany.*)

SYRUP OF SAFFRON.*

This, although one of the least of the Pharmacopœia preparations, is not unfrequently prescribed as a colouring agent, especially in saline mixtures. It is therefore highly desirable that an agent so employed should not render such mixtures, etc., inelegant, or the object for which it is used is entirely frustrated.

Syrup of Saffron, when prepared in accordance with the authorized formula, in the short space of a week or ten days becomes unfit for use; and this appears to arise from an action of the spirit (aided by the sugar) on the colouring matter (polychroite) of the saffron. A dirty-looking deposit is formed, which, when placed under the microscope, is seen to consist of small crystalline tufts, of a dark-orange or reddish colour; whilst the bulk of the syrup is thus rendered much lighter, and in a longer period almost colourless. The deposit is not redissolved by dilution with water, and it is to this fact that its inelegance as a colouring agent is due; if strained (when diluted) the colour is nearly lost, and if not strained it is considerably less than if newly prepared syrup were used. That the sugar assists in causing the deposition of the colouring matter appears evident, since an infusion of saffron, to which a proportionate quantity of spirit has been added, does not yield a deposit, when kept for a much longer period than that above mentioned; still in this the spirit exerts a prejudicial influence on the colouring matter.

In preparing the syrup I tried the addition of glycerine instead of spirit, but this, after being kept under the most unfavourable circumstances for six or seven weeks, became opalescent. I find, however, that if the syrup is prepared according to the directions given in the Pharmacopœia, *without the addition of any preservative agent*, it is an elegant and stable preparation.

Charles Symes.

Leamington, June 17, 1863.

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* *Vide* Pharm. Journ. vol. vi. p. 72.

A NEW CHROMIUM GREEN.

BY M. MATHIEU PLESSY.

One part of bichromate of potash is dissolved in 10 parts of boiling water, 3 litres of biphosphate of lime, and 1 kilo. 250 grammes of brown sugar.*

A considerable evolution of gas is produced after some time, and when the reaction is complete, the mixture is allowed to stand a day or two, and the green deposits. The precipitate is washed with cold water till all trace of acid is removed, and dried by a gentle heat.

This green, which contains no poisonous ingredient, is not altered by light; sulphuretted hydrogen does not act on it; mineral acids, even concentrated, do not destroy it, and dissolve it but very slowly. It has been found to give an excellent green paint, and may be fixed by albumen on fabrics.—*Répertoire de Chimie.*

ON THE ACIDS OF GUM BENZOIN.

BY MM. KOLBE AND LAUTEMANN.

The peculiar acid discovered by M. Kolbe and Lautemann in the gum benzoin of Sumatra, and supposed to be toluylic acid, has been found by the authors to be a complex acid made up of two parts of benzoic and one part of cinnamic acid. It is easy to prove the presence of the latter. The gum resin is boiled with milk of lime, filtered, and the filtrate precipitated by hydrochloric acid. Permanganate of potash is then added. If cinnamic acid be present, the odour of bitter almonds is developed, arising from its reduction.

These two acids are always found in the same proportions in the different varieties of benzoin. The authors thought from this fact that they existed as a conjugate acid, similar to the butyro-acetic, of the component acids of which they are homologues.

Acetic Acid	$C_4H_4O_4$	Benzoic Acid	$C_{14}H_6O_4$
Butyric Acid	$C_8H_8O_4$	Cinnamic Acid	$C_{18}H_8O_4$

However, the combination is not so intimate, for the acids may be separated not only by fractional precipitation, but by simple crystallization. The fusing-point of this complex acid is 26° (78° Fahr.) less than that of Benzoic acid, 120° (249° Fahr.); and Aschoff has ascertained that it requires very little cinnamic acid to lower considerably the fusing-point of benzoic acid.

The complete separation of these acids was effected by fractional precipitation from their ammoniacal salts with nitrate of silver.

M. Aschoff has ascertained the exclusive presence of cinnamic acid in the kernels of a benzoin from Sumatra, which had a strong odour of storax. The greater part of these kernels were soluble in ether. The solution contained,—

Cinnamic Acid	11 p.c.
Resin soluble in alcohol	78 p.c.
Extractive matter	4·5 p.c.

The kernels also contained 5·4 p.c. of a resin soluble in alcohol but insoluble in ether.—*Journal de Pharmacie.*

ESTIMATION OF NITRIC ACID.

BY M. H. ROSE.

M. F. Reich has shown that powdered quartz drives off the nitric acid from nitrates, and particularly from alkaline nitrates, at a barely perceptible red heat. This reaction may be made available in the determination of nitric acid by difference. The nitrate is merely heated with four or six times its weight of quartz in fine powder.

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* We give the quantities as recommended by the author, although the proportions are not very evident.

The use of quartz is preferable to that of bichromate of potash, because the mass cannot fuse, and is not liable to projections.

The presence of chlorides and sulphates does not affect the process, the nitrates alone being decomposed. Amorphous and crystalline silica are identical in their action.

Silica may also replace bichromate of potash in estimating carbonic acid. To expel all the carbonic acid, a greater heat is required than for the decomposition of the nitrates. The bright red-heat afforded by a Bunsen burner is however always sufficient. —*Poggendorff's Annalen.*

RESEARCHES ON HENNA.

BY M. ABD-EL-AZIZ HERRAONY, OF CAIRO, EGYPT.

The author, a graduate of the School of Pharmacy of Paris, selected Henna as the subject of his thesis. Henna (*Lawsonia inermis*) is a plant which has been known to the people of the East from the highest antiquity. The leaves are employed either as a medicine or in the preparation of certain cosmetics. Its flowers, possessing equal medicinal virtue, are used as an agreeable perfume. They are sold in Cairo, as the lilac is in Paris.

Henna is common in the East Indies, at Malabar, Ceylon, etc., and in Arabia, Persia, and Egypt, where it is very abundant. The author admits of only one species—*Lawsonia alba*, of which there are two varieties, *L. inermis* and *L. spinosa*. The leaves are employed as a topical application to ulcers of the mouth, and for staining the feet, hands, and hair. This use is perhaps less the result of coquetry than to avoid certain skin diseases, so common in hot countries. The leaves are also used for dyeing light-coloured woods of a mahogany colour. The fruit is considered emmenagogue.

Henna is furnished to commerce in the form of powder. Two sorts are distinguished; *Henna of Arabia*, and *Henna of Egypt*, the latter least esteemed. The former is often adulterated with sand and Egyptian henna, so as to be about equal in dyeing value to the latter.

The author in his chemical examination has aimed at isolating the active colouring-principle. Cold water does not extract it, but it is removed by boiling water. Ether does not remove it, but extracts the chlorophyll. Alcohol of ninety per cent. completely extracts it by percolation; and when the alcohol is distilled off from the tincture, the syrupy residue exhausted by ether, and the residue again treated by strong alcohol, and evaporated, the active matter is obtained.

The principle is brown, of a resinoid appearance, and soluble in boiling water. It possesses the properties of tannin, such as blackening the sesqui-salts of iron and precipitating gelatine. It reduces oxide of copper in Trommer's test, and heat decomposes it with the evolution of crystalline needles, which reduce nitrate of silver. The colouring matter of henna is therefore a species of tannin, and the author has named it *henno-tannic acid.*

The author made various experiments with henna as a dye-stuff, for silk and woollen, with results favourable to the permanence of the shades of colour produced.—*Journal de Pharmacie, Jan.* 1863.

NEW SILK MOTH.

The introduction of a new Silk Moth (*Bombyx Cynthia*) into Europe bids fair to be of great importance. It was first sent from China to Turin by a Piedmontese missionary in 1857, and so early as 1858 it had attracted the attention of Guérin-Meneville at Paris, so far as to induce him to plant 5000 trees of *Ailanthus glandulosa*, on the leaves of which the caterpillar feeds. It is reported that the almost incredible quantity of 100 millions of trees are now planted in France for the sustenance of the caterpillar, insomuch that Guérin-Méneville has said that "Henry IV. gave us silk for the rich, but Napoleon III. has given silk to the poor."

We believe, indeed, with every reader of 'Quentin Durward,'* that silk was produced in France long before the reign of Henry IV.; but however this may be, the

* Louis XI. is there spoken of as the great silk-merchant and cultivator of Mulberry-trees, under the name of Maître Pierre.

produce of *Bombyx Cynthia* is of a far coarser and more durable nature than ordinary silk. In China it forms the greater part of the material of which the clothing of the middle-class is made, and is so durable that a garment descends from parent to child, besides having the valuable qualities of never contracting grease spots, and being waterproof.

So useful an article of commerce, the culture of which had already extended from Italy to France, Switzerland, and Belgium, could scarcely help attracting the attention of Austria, where there is such variety of soil and climate, suited in some locality or other for almost everything which can be employed to any useful purpose in art or manufacture, provided it does not require tropical heat. Experiments were accordingly made at Trieste and Görtz in raising the new silkworm, and apparently with some success. It was however desirable to ascertain whether there was any promise for more northern latitudes. Accordingly a manufacturer of the name of Fichtner, at Atzgersdorf, at a short distance from Vienna, on the borders of the river March, a tributary of the Danube from the north, has taken the matter in hand, and has laid before the Trade Union of Lower Austria, on the 17th of October, 1862, an account of his experiments, of which we now have an abstract before us.

One great advantage attending the culture consists in the fact that unlike the common silkworm, the *Ailanthus* caterpillar requires scarcely any care, if a single harvest only is desired. If, however, two or more are sought for, the eggs must be hatched artificially, and the caterpillars fed on the leaves of *Dipsacus fullonum*, or artificially forced *Ailanthus*, till the leaves are expanded in the open air. At present great difficulty has been experienced in running off the silk from the cocoon, and in consequence, the process of carding must be employed, which is wasteful, besides yielding a kind of silk resembling wool rather than common silk. But even here there is one advantage, viz. that the cocoon is far less injured when the moth makes its appearance than in that of the old silkworm.

All that is necessary where a single crop only is desired, which is conceived to be the most useful plan for Austria, especially for small proprietors, the persons who are expected most to profit by the scheme, is to cover the hedge of *Ailanthus*, the most convenient form in which the plants can be grown, with a common net spread over hoops, to protect the caterpillars from the house sparrow, which is peculiarly fond of them,—a curious matter, as they are so very different from any caterpillar to which sparrows are used.*

The insect assumes the pupa state in from thirty-eight to forty days after the caterpillars first make their appearance, and in about twenty days more the moths appear. The pupæ must be placed in some convenient box lined with cotton and covered with network for protection, in order that the eggs may not be lost, and may be conveniently removed by cutting to pieces the lining or net to which they are attached. Unfortunately the eggs retain their vitality only for a short time, and dependence therefore for the next year's crop must be placed on those pupæ which do not at once change to the imago.

Experiments have been tried in the north-eastern corner of Moravia, at the northern foot of the Carpathian Mountains, which have been equally crowned with success, a circumstance which makes it not impossible that the insects may succeed in those parts of Great Britain where the *Ailanthus* will flourish. Success indeed is more probable, as the caterpillars are not impatient of moderate changes of temperature, though as autumn advances, when the nights are cold, they will begin to spin the cocoons, but will not finish them, as they die before they can attain the state of pupæ. There is the more reason to hope that they may succeed in England, as the degree of labour which they require is so small as not to make it a very serious item of expense.

At present, the experience is of so short a date in Germany that it is quite premature to speak of the relative expense of production and profit. Herr Fichtner however is sanguine that without detracting much from other objects of cultivation, the small proprietor will find his end answered in having on his few acres a hedge or two of

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* The caterpillars are at first black with yellow spots, then yellow with black spots, then white with black spots, then emerald-green with indigo spots, when they are very fat and greedily sought by the birds.

Ailanthus, which will produce about a pound of silk for every twelve feet, the only expense being the wear and tear of the protecting net, as the small amount of labour can easily be supplied by the cottager's family.—*M. J. B., in the Gardeners' Chronicle.*

MUMMY WHEAT.

The 'Presse Scientifique des Deux Mondes' contains a description of a series of experiments made in Egypt by Figari-Bey on the wheat found in the ancient sepulchres of that country. A long dispute occurred a few years ago, as to what truth there might be in the popular belief, according to which this ancient wheat will not only germinate after the lapse of three thousand years, but produce ears of extraordinary size and beauty. The question was left undecided; but Figari-Bey's paper, addressed to the Egyptian Institute at Alexandria, contains some facts which appear much in favour of a negative solution. One kind of wheat which Figari-Bey employed for his experiments had been found in Upper Egypt, at the bottom of a tomb at Medinet-Aboo, by M. Schnepp, secretary to the Egyptian Institute. There were two varieties of it, both pertaining to those still cultivated in Egypt. The form of the grains had not changed; but their colour, both within and without, had become reddish, as if they had been exposed to smoke. The specific weight was also the same, viz. twenty-five grains to a gramme. On being ground they yield a good deal of flour, but are harder than common wheat, and not very friable; the colour of the flour is somewhat lighter than that of the outer envelope. Its taste is bitter and bituminous; and when thrown into the fire, it emits a slight but pungent smell. On being sown in moist ground, under the usual pressure of the atmosphere, and at a temperature of 25° (Réaumur), the grains became soft, and swelled a little during the first four days; on the seventh day their tumefaction became more apparent, with an appearance of maceration and decomposition; and on the ninth day this decomposition was complete. No trace of germination could be discovered during all this time. Figari-Bey obtained similar negative results from grains of wheat found in other sepulchres, and also on barley proceeding from the same source; so that there is every reason to believe that the ears hitherto ostensibly obtained from mummy wheat proceed from grain accidentally contained in the mould into which the former was sown.*—*Veterinarian, May,* 1863.

A BILL FOR THE PREVENTION OF ACCIDENTAL POISONING.

(*Prepared and brought in by Mr. Paull, Mr. Sclater-Booth, and Mr. Walter, July* 10, 1863.)

Whereas it is expedient to prevent accidental poisoning: be it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords spiritual and temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

1. From and after the *first day of November, one thousand eight hundred and sixty-three*, no substance of a poisonous nature, or calculated to injure or endanger human health or life if taken internally, shall be sold or exposed for sale by retail in any paper or other packet, but only in a glass phial or bottle of a hexagonal shape, of which five sides shall be fluted, and on the remaining side thereof a label shall be affixed, with the word "poison" and directions for use distinctly marked thereon; and every person who shall act in contravention of this Act shall for every such offence, on a summary conviction for the same before two justices of the peace at petty sessions in England, and in Scotland before two justices of the peace in justice of the peace court, or before the sheriff substitute of the county, or before justices at petty sessions or a divisional justice in Ireland, forfeit and pay a penalty not exceeding *five pounds*, together with such costs attending such conviction as to the said justices shall seem reasonable; and if any person

* These results of Figari-Bey entirely agree with all reliable experiments which have been made in this country with wheat grains obtained from mummies.—Ed. Ph. J.

so convicted shall afterwards commit the like offence it shall be lawful for such justices to cause such offender's name, place of abode, and offence to be published, at the expense of such offender, in such newspaper or in such other manner as to such justices shall seem desirable.

A BILL [AS AMENDED IN COMMITTEE] TO PROHIBIT THE SALE AND USE OF POISONED GRAIN OR SEED.

Whereas it is expedient to prohibit the sale and use of poisoned grain, seed, or meal: be it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords spiritual and temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—

1. This Act may be cited for all purposes as "The Poisoned Grain Prohibition Act, 1863."

2. Every person who shall offer or expose for sale or sell any grain, seed, or meal which has been so steeped or dipped in poison, or with which any poison or any ingredient or preparation has been so mixed, as thereby to render the same poisonous, and calculated to destroy life, shall in either case for every such offence, upon summary conviction, as hereinafter provided, forfeit any sum not exceeding ten pounds.

3. Every person who shall knowingly and wilfully sow, cast, set, lay, put, or place, or cause to be sown, cast, set, laid, put, or placed, into, in, or upon any ground or other exposed place or situation, any such grain, seed, or meal which has been so steeped or dipped in poison, or with which poison or any ingredient or preparation has been so mixed as thereby to render such grain, seed, or meal poisonous, and calculated to destroy life, shall, upon a summary conviction thereof as hereinafter provided, forfeit any sum not exceeding ten pounds.

4. Nothing in this Act shall prohibit the offering or exposing for sale or selling or the use of any solution or infusion, or any material or ingredient for dressing, protecting, or preparing any grain or seed for bonâ fide use in agriculture only, or the sowing of such last-mentioned grain or seed so prepared.

5. All penalties imposed by this Act may be recovered in England and Ireland before two justices of the peace, and in Scotland before two justices of the peace or the sheriff; and for that purpose in England and Scotland the provisions of the Act of the eleventh and twelfth years of Her present Majesty, chapter forty-three, and in Ireland, the "Petty Sessions (Ireland) Act, 1851," shall extend and apply to this Act, and to all proceedings in relation thereto; and it shall not in any such proceedings be necessary to allege or prove the ground or other place where an offence is committed to be the property of or occupied by any person: provided always, that the convicting justices or sheriff may, if they or he shall think fit, award to the informer or prosecutor (not being a police constable or peace officer) in any such proceedings, any portion not exceeding one moiety of any penalty recovered under the aforesaid enactments: provided also, that every informer or prosecutor, and every person who shall give evidence against any other person proceeded against under this Act, shall be freed and discharged from any such penalty which he may have incurred for or by reason of his having participated or aided in the commission of the offence with respect to which he shall so inform or prosecute or give evidence, provided the information against such other person has been laid, or such evidence has been given, before the laying of any information (if any) against such informer, prosecutor, or witness for the recovery of any penalty he may have so incurred.

A BILL [AS AMENDED IN COMMITTEE] INTITULED AN ACT FOR THE MORE EFFECTUAL CONDENSATION OF MURIATIC ACID GAS IN ALKALI WORKS.

(*Brought from the Lords, April* 30, 1863. *Ordered to be printed, July* 8, 1863.)

Whereas it is expedient to provide for the better condensation of the muriatic acid gas evolved in alkali works: be it enacted by the Queen's most Excellent Majesty, by

and with the advice and consent of the Lords spiritual and temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—

1. *Preliminary.*—This Act may be cited as the "Alkali Act, 1863."

2. This Act shall come into operation on the first day of January, one thousand eight hundred and sixty-four.

3. The term "alkali work," as hereinafter used, shall mean every work for the manufacture of alkali, sulphate of soda, and sulphate of potash, in which muriatic acid gas is evolved: the term "owner," as hereinafter used, shall mean the lessee or occupier or any other person carrying on any alkali work: the term "the inspector" shall mean the inspector to be appointed under this Act.

4. *Alkali Works.*—Every alkali work shall be carried on in such manner as to secure the condensation to the satisfaction of the inspector, derived from his own examination or from that of a sub-inspector, of not less than ninety-five per centum of the muriatic acid gas evolved therein: Provided always, that nothing herein contained shall entitle the inspector to direct any alteration to be made in the process of manufacture or the apparatus used therein. If any alkali work is carried on in contravention of this section, the owner of that work shall, on its being made to appear to the Court before which any proceedings for recovery of a penalty may be instituted that ninety-five per centum at least of the muriatic acid gas evolved in such work in any one period of four hours has not been condensed, be deemed to be guilty of an offence against this Act, and be subject in respect of the first conviction to a penalty not exceeding fifty pounds, and in respect of every offence after a previous conviction to a penalty not exceeding one hundred pounds: Provided always, that no such owner shall be convicted of more than one such offence in respect of any one day: Provided also, that no such penalty shall be inflicted unless the inspector shall produce before the Court having cognizance of the matter a statement in writing of the facts on which he founds his opinion that ninety-five per centum of the muriatic acid gas evolved in the alkali work is not condensed therein, and serve a copy thereof with the process commencing the proceedings.

5. The owner of any alkali work in which any offence against this Act has been proved to have been committed, and for which a pecuniary penalty may be imposed, shall in every case (save as hereinafter provided) be deemed, in the first instance, to have committed the offence, and shall be liable to pay the penalty; but any owner who shall have been proceeded against shall be entitled to have any agent, servant, or workman whom he shall charge as the actual offender brought by due process of law before the Court at the time appointed for hearing the case made against such owner; and if after the commission of the offence has been proved the owner shall prove to the satisfaction of the Court that he had used due diligence to comply with and to enforce the execution of the Act, and that the said agent, servant, or workman had committed the offence in question without his knowledge, consent, or connivance, the said agent, servant, or workman, if he has been brought by summons before the Court as aforesaid, may be convicted of such offence, and shall pay the penalty instead of the owner, and the payment of such penalty and costs shall be enforced against the agent, servant, or workman in like manner as penalties are made recoverable by this Act: Provided, that when it shall be made to appear to the satisfaction of the inspector at the time of discovering the offence that the owner had used all due diligence to comply with and to enforce the execution of this Act, and also by what person such offence had been committed, and also that it had been committed without the personal consent, connivance, or knowledge of the owner, and in contravention of his orders, then the inspector shall proceed against the person whom he shall believe to be the actual offender in the first instance without first proceeding against the owner.

6. No alkali work shall at any time after the expiration of three months after the appointment of the inspector be carried on or prosecuted until such work has been registered by the owner with the inspector. In every register hereby required to be made there shall be inserted the name in full of the owner, and of the parish or township in which the work is situate, and within one month after change of ownership in any such work the register of such work shall be amended by inserting the name of the new owner, and if any alkali work is carried on in contravention of this section, the owner thereof shall, on conviction, be deemed to be guilty of an offence against this Act, and shall be subject to a penalty not exceeding five pounds for every day during which such work shall have been so carried on.

7. *Inspectors.*—For the purpose of carrying into effect the provisions of this Act, the Board of Trade may from time to time appoint any fit and proper person to be inspector of alkali works under this Act, and may from time to time remove any inspector so appointed, and appoint another person in his place. The Board of Trade may also, on application of the inspector, from time to time appoint and remove such sub-inspector or sub-inspectors as the said Board may deem necessary for the purpose of carrying this Act into effect. Notice of the appointment of such inspector and sub-inspectors shall be published in the 'London Gazette,' and a copy of the gazette shall be evidence of the appointment made.

8. No person either directly or indirectly acting or practising as a land agent, or directly or indirectly engaged in any manufacture, or interested in any patent in or according to which the decomposition of salt or the condensation of muriatic acid gas may be effected, shall act as an inspector or sub-inspector under this Act.

9. It shall be the duty of every inspector under this Act to ascertain from time to time that all the alkali works are carried on in conformity with the provisions of this Act, and to enforce the said provisions, and to cause notice to be given to every owner whose work shall be carried on in contravention of this Act of the commission of such offence as soon as conveniently may be after the commission thereof; and with a view to the performance of that duty he or any sub-inspector may at all reasonable times, by day and by night, without giving previous notice, but so as not to interrupt the process of the manufacture, enter upon and inspect any alkali work, and examine into the efficiency of the condensing apparatus, and the quantity of muriatic acid gas condensed, and generally into all matters and works tending to show compliance or non-compliance with the provisions of this Act. And the owner of such works, upon demand of the inspector, shall within a reasonable time furnish him with a plan, to be kept secret by such inspector, of those parts of such works in which the decomposition of salt or other process causing the evolution of muriatic gas or the condensation thereof is carried on. It shall be lawful for the inspector or any sub-inspector under his direction, but so as not to interfere with the process of the manufacture, to apply any tests or make any experiments he may think proper for the purpose of ascertaining the efficiency of the condensing apparatus, or the quantity of gas condensed; and the owner or agent of the works shall be deemed to be guilty of an offence against this Act unless he renders to the said inspector or sub-inspector all necessary facilities for their entry, examination, and testing.

10. Every inspector and sub-inspector appointed under this Act shall be paid such salary as may be determined by the Board of Trade, with the consent of the commissioners of Her Majesty's Treasury.

11. Every person who wilfully obstructs any inspector or sub-inspector in the execution of this Act, and every owner of any alkali work who refuses or neglects to afford to the inspector or sub-inspector the facilities necessary for making any entry, inspection, examination, or testing under this Act, or who neglects or wilfully violates any provision of this Act, for the neglect or violation of which no other penalty is by this Act imposed, shall be guilty of an offence within the meaning of this Act, and shall for every such offence incur a penalty not exceeding ten pounds.

12. The inspector shall, on or before the first day of March in every year, make a report in writing to the Board of Trade of his proceedings during the preceding year, and a copy of such report shall be laid before both Houses of Parliament.

13. *Special Rules.*—The owner of any alkali work may, with the sanction of the Board of Trade, make, alter, or repeal special rules for the guidance of such of his workmen as are employed in any process causing the evolution of muriatic acid gas, or whose duty it is to attend to the apparatus used in the condensation of that gas, and may annex penalties to any violation of such rules, so that no penalty exceeds two pounds for any one offence. A printed copy of the special rules in force in any alkali work shall be given by the owner of the work to every person working or employed in or about that work affected thereby.

14. *Penalties.*—The following regulations shall be enacted with respect to the recovery in England of penalties for offences other than offences against a special rule:— Every such penalty shall be recovered by action in the county court having jurisdiction in the district in which the alkali works are situate in respect of which the penalty arises. The action shall be brought, with the sanction of the Board of Trade, by the inspector appointed under this Act, within three months after the commission of the

offence, and for the purposes of such action the penalty shall be deemed to be a debt due to such inspector. The plaintiff in any action for a penalty under this Act shall be presumed to be the inspector appointed under this Act, until the contrary is proved by the defendant. The Court may, upon the application of either party, appoint a person to take down in writing the evidence of the witnesses, and may award to that person such compensation as the Court thinks just. The amount of compensation awarded by the judge shall be deemed to be costs in the cause. If either party in any action for a penalty under this Act feels aggrieved by the decision of the Court in point of law, or on the merits, or in respect of the admission or rejection of any evidence, he may appeal from that decision to any of the superior courts of common law at Westminster. The appeal shall be in the form of a special case to be agreed upon by both parties or their attorneys, and if they cannot agree, to be settled by the judge of the county court upon the application of the parties or their attorneys. The court of appeal may draw any inferences from the facts stated in the case that a jury might draw from facts stated by witnesses. Subject to the provisions of this section, all the enactments, rules, and orders relating to proceedings in actions in county courts, and to enforcing judgments in county courts, and appeals from decisions of the county court judges, and to the conditions of such appeals, and to the power of the superior courts on such appeals, shall apply to an action for a penalty under this Act, and to an appeal from such action, in the same manner as if such action and appeal related to a matter within the ordinary jurisdiction of the Court. Within the City of London and the liberties thereof the Sheriffs Court, established by a local Act passed in the eleventh year of the reign of Her present Majesty, chapter seventy-one, intituled "an Act for the more easy recovery of small debts and demands within the City of London and the liberties thereof," shall be deemed to be the county court having jurisdiction in the case.

15. In Scotland any offence under this Act, with the exception of offences against a special rule, shall be prosecuted at the instance of the inspector, with the sanction of the Board of Trade, before the sheriff or sheriff substitute of the county in which the offence has been committed, and the sheriff or sheriff substitute having cognizance of such offence may award costs to either party, and may sentence the offender to imprisonment for any period not exceeding six months, unless the penalty and costs be previously paid; and any decision or sentence of such sheriff or sheriff substitute shall be subject to review and appeal according to law.

16. In Ireland all penalties incurred under this Act, with the exception of penalties against a special rule, may be recovered by civil bill at the instance of the inspector, with the sanction of the Board of Trade, in the manner and with the appeal directed by an Act passed in the fourteenth and fifteenth years of Her Majesty, chapter fifty-seven, or any Act or Acts amending the law relating to civil bills.

17. All penalties recovered under this Act, except in respect of offences against a special rule, shall be paid into the receipt of Her Majesty's Exchequer in such manner as the commissioners of the Treasury may determine.

18. All penalties incurred under this Act in respect of any offence against a special rule may be recovered summarily in England and Ireland before two or more justices; as to England, in manner directed by an Act passed in the session holden in the eleventh and twelfth years of the reign of Her Majesty Queen Victoria, chapter forty-three, intituled "an Act to facilitate the performance of the duties of justices of the peace out of sessions within England and Wales with respect to summary convictions and orders," or any Act amending the same; as to Ireland, in manner directed by the Act passed in the session holden in the fourteenth and fifteenth years of the reign of Her Majesty Queen Victoria, chapter ninety-three, intituled "an Act to consolidate and amend the Acts regulating the proceedings of petty sessions, and the duties of justices of the peace out of quarter sessions, in Ireland," or any Act amending the same; and in Scotland, before the sheriff or two justices in manner directed by "the Railways Clanses Consolidation, Scotland, Act, 1845," with respect to penalties imposed by that Act the recovery of which is not otherwise provided for.

19. This Act shall continue in force to the first day of July, one thousand eight hundred and sixty-eight, and no longer.

[*Note.*—The Commons' amendments to this Bill, on its return to the Upper House, were agreed to, with the exception of that imposing penalties upon the workmen for

offences against the Act, which was rejected, as it was contended that the master alone should be liable; however, on the return of the Bill to the Commons, this rejection was not agreed to, so that Bill stands as it was amended by the Commons.]

A BILL INTITULED AN ACT TO PREVENT FALSE REPRESENTATIONS AS TO GRANTS OF MEDALS OR CERTIFICATES MADE BY THE COMMISSIONERS FOR THE EXHIBITIONS OF 1851 AND 1862.

(*Presented by Lord Somerhill. Printed 20th July*, 1863.)

Whereas it is expedient to prevent false representations with respect to grants of medals and certificates by the Commissioners for the Exhibition of 1851 and the Commissioners for the Exhibition of 1862: be it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords spiritual and temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—

1. If any trader commits any of the offences following; that is to say,

(1) Falsely represents that he has obtained a medal or certificate from the Exhibition Commissioners;

(2) Falsely represents that any other trader has obtained a medal or certificate from the Exhibition Commissioners;

(3) Falsely represents that any article sold or exposed for sale has been made by, or by any process invented by, a person who has obtained in respect of such article or process a medal or certificate from the Exhibition Commissioners;

He shall incur the following penalties; that is to say,

(1) For the first offence he shall forfeit to Her Majesty a sum not exceeding five pounds.

(2) For any subsequent offence he shall forfeit to Her Majesty a sum not exceeding twenty pounds, or be imprisoned for a period not exceeding six months.

2. In proceedings under this Act it shall not be necessary to prove that any person has sustained damage by the false representations of the defendant. In proceedings under this Act the defendant shall be deemed, until he has proved the contrary, to have known the falsehood of any representation made by him that has been proved to be false. It shall not be necessary in any proceedings under this Act to set out any copy or facsimile of any medal or certificate.

3. For the purposes of this Act "The Exhibition Commissioners" shall mean the Commissioners for the Exhibition of 1851 and the Commissioners for the Exhibition of 1862, or either of such bodies of commissioners. The term "defendant" shall mean any person against whom proceedings may be taken under this Act.

4. Offences under this Act may be prosecuted summarily in England and Ireland before two justices; as to England, in manner directed by an Act passed in the session holden in the eleventh and twelfth years of the reign of Her Majesty Queen Victoria, chapter forty-three, intituled "An Act to facilitate the performance of the duties of justices of the peace out of sessions within England and Wales with respect to summary convictions and orders," or any Act amending the same; as to Ireland, in manner directed by the Act passed in the session holden in the fourteenth and fifteenth years of the reign of Her Majesty Queen Victoria, intituled "An Act to consolidate and amend the Acts regulating the proceedings in petty sessions, and the duties of justices of the peace out of quarter sessions, in Ireland," or any Act amending the same. In Scotland, an offence against this Act may be prosecuted summarily at the instance of the procurator fiscal before any sheriff or before any two justices of the county, or before the magistrates or any police magistrate of the burgh in which the offence was committed.

5. No provision of this Act shall take away, diminish, or prejudicially affect any suit, process, proceeding, right, or remedy which any person may be entitled to at law, in equity, or otherwise; nor exempt or excuse any person from answering or making discovery upon examination as a witness, or upon interrogatories or otherwise, in any suit or other civil proceeding: Provided always, that no evidence, statement, or discovery which any person shall be compelled to give or make shall be admissible in evidence against

such person in support of any indictment for a misdemeanour at common law or otherwise, or of any proceeding under the provisions of this Act.

6. This Act may be cited for all the purposes as "The Exhibition Medals Act, 1863."

ON RADIATION THROUGH THE EARTH'S ATMOSPHERE.

BY JOHN TYNDALL, ESQ., F.R.S.

(*Read at a Meeting of the Royal Institution of Great Britain, Friday, Jan.* 23, 1863.)

Nobody ever obtained the idea of a line from Euclid's definition that it is length without breadth. The idea is obtained from a real physical line drawn by a pen or pencil, and therefore possessing width; the idea being brought, by a process of abstraction, more nearly into accordance with the conditions of the definition. So also with regard to physical phenomena; we must help ourselves to a conception of the invisible by means of proper images derived from the visible, afterwards purifying our conceptions to the needful extent. Definiteness of conceptions, even though at some expense to delicacy, is of the greatest utility in dealing with physical phenomena. Indeed it may be questioned whether a mind trained in physical research can at all enjoy peace, without having made clear to itself some possible way of conceiving of those operations which lie beyond the boundaries of sense, and in which sensible phenomena originate.

When we speak of radiation through the atmosphere, we ought to be able to affix definite physical ideas, both to the term atmosphere and the term radiation. It is well known that our atmosphere is mainly composed of the two elements oxygen and nitrogen. These elementary atoms may be figured as small spheres scattered thickly in the space which thickly surrounds the earth. They constitute about 99½ per cent. of the atmosphere. Mixed with these atoms we have others of a totally different character; we have the molecules, or atomic groups, of carbonic acid, of ammonia, and of aqueous vapour. In these substances diverse atoms have coalesced to form little systems of atoms. The molecules of aqueous vapour, for example, consist of two atoms of hydrogen united to one of oxygen; and they mingle as little triads among the monads of oxygen and nitrogen, which constitute the great mass of the atmosphere.

These atoms and molecules are separate; but in what sense? They are separate from each other in the sense in which the individual fishes of a shoal are separate. The shoal of fish is embraced by a common medium, which connects the different members of the shoal, and renders intercommunication between them possible. A medium also embraces our atoms; within our atmosphere exists a second and a finer atmosphere, in which the atoms of oxygen and nitrogen hang like suspended grains. This finer atmosphere unites not only atom with atom, but star with star; and the light of all suns, and of all stars, is in reality a kind of music propagated through this interstellar air. This image must be clearly seized, and then we have to advance a step. We must not only figure our atoms suspended in this medium, but we must figure them vibrating in it. In this motion of the atoms consists what we call their heat. "What is heat in us," as Locke has perfectly expressed it, "is in the body heated nothing but motion." Well, we must figure this motion communicated to the medium in which the atoms swing, and sent in ripples through it with inconceivable velocity to the bounds of space. Motion in this form, unconnected with ordinary matter, but speeding through the interstellar medium, receives the name of Radiant Heat; and if competent to excite the nerves of vision, we call it Light.

Aqueous vapour was defined to be invisible gas. Vapour was permitted to issue horizontally with considerable force from a tube connected with a small boiler. The track of the cloud of condensed steam was vividly illuminated by the electric light. What was seen, however, was not vapour, but vapour condensed to water. Beyond the visible end of the jet the cloud resolved itself into true vapour. A lamp was placed under the jet at various points; the cloud was cut sharply off at that point, and when the flame was placed near the efflux orifice the cloud entirely disappeared. The heat of the lamp completely prevented precipitation. This same vapour was condensed and congealed on the surface of a vessel containing a freezing mixture, from which it was

scraped in quantities sufficient to form a small snowball. The beam of the electric lamp, moreover, was sent through a large receiver placed on an air-pump. A single stroke of the pump caused the precipitation of the aqueous vapour within, which became beautifully illuminated by the beam; while, upon a screen behind, a richly-coloured halo, due to diffraction by the little cloud within the receiver, flashed forth.

The waves of heat speed from our earth through our atmosphere towards space. These waves dash in their passage against the atoms of oxygen and nitrogen, and against the molecules of aqueous vapour. Thinly scattered as these latter are, we might naturally think meanly of them as barriers to the waves of heat. We might imagine that the wide spaces between the vapour molecules would be an open door for the passage of the undulations; and that if those waves were at all intercepted, it would be by the substances which form 99½ per cent. of the whole atmosphere. Three or four years ago, however, it was found by the speaker that this small modicum of aqueous vapour intercepted fifteen times the quantity of heat stopped by the whole of the air in which it was diffused. It was afterwards found that the dry air then experimented which was not perfectly pure, and that the purer the air became, the more it approached the character of a vacuum, and the greater, by comparison, became the action of the aqueous vapour. The vapour was found to act with 30, 40, 50, 60, 70 times the energy of the air in which it was diffused; and no doubt was entertained that the aqueous vapour of the air which filled the Royal Institution theatre, during the delivery of the disconrse, absorbed 90 or 100 times the quantity of radiant heat which was absorbed by the main body of the air of the room.

Looking at the single atoms, for every 200 of oxygen and nitrogen there is about one of aqueous vapour. This one, then, is eighty times more powerful than the 200; and hence, comparing a single atom of oxygen or nitrogen with a single atom of aqueous vapour, we may infer that the action of the latter is 16,000 times that of the former. This was a very astonishing result, and it naturally excited opposition, based on the philosophic reluctance to accept a result so grave in consequences before testing it to the uttermost. From such opposition a discovery, if it be worth the name, emerges with its fibre strengthened; as the human character gathers force from the healthy antagonisms of active life. It was urged, that the result was on the face of it improbable; that there were, moreover, many ways of accounting for it, without ascribing so enormous a comparative action to aqueous vapour. For example, the cylinder which contained the air in which these experiments were made, was stopped at its ends by plates of rocksalt, on account of their transparency to radiant heat. Rocksalt is hygroscopic; it attracts the moisture of the atmosphere. Thus, a layer of brine readily forms on the surface of a plate of rocksalt; and it is well known that brine is very impervious to the rays of heat. Illuminating a polished plate of salt by the electric lamp, and casting, by means of a lens, a magnified image of the plate upon a screen, the speaker breathed through a tube for a moment on the salt; brilliant colours of thin plates (soap-bubble colours) flashed forth immediately upon the screen—these being caused by the film of moisture which overspread the salt. Such a film, it was contended, is formed when undried air is sent into the cylinder; it was, therefore, the absorption of a layer of brine which was measured, instead of the absorption of aqueous vapour.

This objection was met in two ways. Firstly, by showing that the plates of salt when subjected to the strictest examination show no trace of a film of moisture. Secondly, by abolishing the plates of salt altogether, and obtaining the same results in a cylinder open at both ends.

It was next surmised that the effect was due to the impurity of the London air, and the suspended carbon particles were pointed to as the cause of the opacity to radiant heat. This objection was met by bringing air from Hyde Park, Hampstead Heath, Primrose Hill, Epsom Downs, a field near Newport in the Isle of Wight, St. Catherine's Down, and the sea-beach near Black Gang Chine. The aqueous vapour of the air from these localities intercepted at least seventy times the amount of radiant heat absorbed by the air in which the vapour was diffused. Experiments made with smoky air proved that the suspended smoke of the atmosphere of West London, even when an east wind pours over it the smoke of the city, exerts only a fraction of the destructive powers exercised by the transparent and impalpable aqueous vapour diffused in the air.

The cylinder which contained the air through which the calorific rays passed was polished within, and the rays which struck the interior surface were reflected from it to the thermo-electric pile which measured the radiation. The following objection was raised:—You permit moist air to enter your cylinder; a portion of this moisture is condensed as a liquid film upon the interior surface of your tube; its reflective power is thereby diminished; less heat therefore reaches the pile, and you incorrectly ascribe to the absorption of aqueous vapour an effect which is really due to diminished reflection of the interior surface of your cylinder.

But why should the aqueous vapour so condense? The tube within is warmer than the air without, and against its inner surface the rays of heat are impinging. There can be no tendency to condensation under such circumstances. Further, let five inches of undried air be sent into the tube,—that is, one-sixth of the amount which it can contain. These five inches produce their proportionate absorption. The driest day, on the driest portion of the earth's surface, would make no approach to the dryness of our cylinder when it contains only five inches of air. Make it 10, 15, 20, 25, 30 inches: you obtain an absorption exactly proportional to the quantity of vapour present. It is next to a physical impossibility that this could be the case if the effect were due to condensation. But lest a doubt should linger in the mind, not only were the plates of rocksalt abolished, but the cylinder itself was dispensed with. Humid air was displaced by dry, and dry air by humid in the free atmosphere; the absorption of the aqueous vapour was here manifest, as in all the other cases.

No doubt, therefore, can exist of the extraordinary opacity of this substance to the rays of obscure heat; and particularly such rays as are emitted by the earth after it has been warmed by the sun. It is perfectly certain that more than ten per cent. of the terrestrial radiation from the soil of England is stopped within ten feet of the surface of the soil. This one fact is sufficient to show the immense influence which this newly-discovered property of aqueous vapours must exert on the phenomena of meteorology.

This aqueous vapour is a blanket more necessary to the vegetable life of England than clothing is to man. Remove for a single summer-night the aqueous vapour from the air which overspreads this country, and you would assuredly destroy every plant capable of being destroyed by a freezing temperature. The warmth of our fields and gardens would pour itself unrequited into space, and the sun would rise upon an island held fast in the iron grip of frost. The aqueous vapour constitutes a local dam, by which the temperature at the earth's surface is deepened: the dam, however, finally overflows, and we give to space all that we receive from the sun.

The sun raises the vapours of the equatorial ocean; they rise, but for a time a vapour screen spreads above and around them. But the higher they rise, the more they come into the presence of pure space, and when, by their levity, they have penetrated the vapour screen, which lies close to the earth's surface, what must occur?

It has been said that, compared atom for atom, the absorption of an atom of aqueous vapour is 16,000 times that of air. Now the power to absorb and the power to radiate are perfectly reciprocal and proportional. The atom of aqueous vapour will therefore radiate with 16,000 times the energy of an atom of air. Imagine then this powerful radiant in the presence of space, and with no screen above it to check its radiation. Into space it pours its heat, chills itself, condenses, and the tropical torrents are the consequence. The expansion of the air, no doubt, also refrigerates it; but in accounting for those deluges, the chilling of the vapour by its own radiation must play a most important part. The rain quits the ocean as vapour; it returns to it as water. How are the vast stores of heat set free by the change from the vaporous to the liquid condition disposed of? Doubtless in great part they are wasted by radiation into space. Similar remarks apply to the cumuli of our latitudes. The warmed air, charged with vapour, rises in columns, so as to penetrate the vapour screen which hugs the earth; in the presence of space, the head of each pillar wastes its heat by radiation, condenses to a cumulus, which constitutes the visible capital of an invisible column of saturated air.

Numberless other meteorological phenomena receive their solution, by reference to the radiant and absorbent properties of aqueous vapour. It is the absence of this screen, and the consequent copious waste of heat, that causes mountains to be so much chilled when the sun is withdrawn. Its absence in Central Asia renders the winter

there almost unendurable; in Sahara the dryness of the air is sometimes such, that though during the day "the soil is fire and the wind is flame," the chill at night is painful to bear. In Australia, also, the thermometric range is enormous, on account of the absence of this qualifying agent. A clear day, and a dry air, moreover, are very different things. The atmosphere may possess great visual clearness, while it is charged with aqueous vapour, and on such occasions great chilling cannot occur by terrestrial radiation. Sir John Leslie and others have been perplexed by the varying indications of their instruments on days equally bright,—but all these anomalies are completely accounted for by reference to this newly-discovered property of transparent aqueous vapour. Its presence would check the earth's loss; its absence, without sensibly altering the transparency of the air, would open wide a door for the escape of the earth's heat into infinitude.

MISCELLANEA.

Poisoning by Essential Oil of Almonds.—At the Leeds Town Hall, May 26th, before Mr. Blackburn, Coroner, an inquest was held on the body of a boy nine years of age, named Josiah Anderson, who lived with his parents in St. Peter's Square. The boy's father was a shoemaker by trade, but about four months ago he opened a shop in Kirkgate for the sale of confectionery. Mrs. Anderson applied to Mr. Topham, druggist, 94, Kirkgate, for some "flavour" for the confectionery, and she states that he recommended her to have "almond flavour." She purchased half an ounce, and not being informed by Mr. Topham that it was poison, or that she was to use it with great caution, she applied it as she thought fit. The business did not pay, and in a few weeks was given up. At that time there was a portion of the "almond flavour" in the bottle, and she put it, with other bottles, in a hole in the wall. On Saturday evening, May 23rd, about seven o'clock, Mrs. Anderson smelt the liquid, and on questioning the deceased, ascertained that he had taken "just a taste." She had never heard of "almond flavour" before it was recommended to her by the druggist, and not being aware that it was poison, she took but little notice of the affair. The boy afterwards went to play, and subsequently had his tea; but about nine o'clock he was taken seriously ill. Mr. John Walter Hopkins, surgeon, was sent for, and he discovered that the boy had been poisoned with essential oil of almonds. He administered an emetic and the usual remedies, but the boy became insensible, and died about one o'clock on the following morning. Mr. Hopkins stated that if he had been called in earlier he might have saved the boy's life, but his parents were not aware that the liquid he had taken was poison, and as soon as the illness manifested itself medical aid was obtained. Mr. Topham said he did not recommend the "almond flavour" to the deceased's mother, though he believed he had sold it to her. He did not tell her it was poison, or label the bottle with the word "poison;" nor did he give her any instructions as to its use. They sold it indiscriminately to any one, confectioners or others, and it was not usual to label it. The jury strongly censured Mr. Topham for so carelessly disposing of poison, and condemned the practice of selling poison without distinctly labelling the bottle, and Mr. Topham promised that for the future he would label the bottles with the word "poison." A verdict of "Accidental death" was returned.—*Leeds Mercury, May 27th.*

Accidental Poisoning by Arsenic.—A number of persons have been taken seriously ill at Bradford, in consequence of taking arsenic mixed in cream of tartar, which was sold at a druggist's shop in that town. On Monday, May 18th, two young women, named Mary Ann and Elizabeth Johnson, of the respective ages of eighteen and twenty, residing with their father, William Johnson, woolcomber, 123, Waddington's Yard, Wakefield Road, were taken seriously ill. Several other members of the family were also affected. Dr. Lodge was called in, and he found the young women suffering from having taken poison, and was informed that they had taken a mixture of cream of tartar and magnesia, the former of which had been purchased at the shop of Mr. Potter, a druggist, in Bridge Street, Bradford. Dr. Lodge and his assistant Dr. Lee applied the stomach-pump to the sufferers, and subsequently discovered, on an analysis of the mixture, as well as of the fluid ejected from the stomachs, that both were largely impregnated with arsenic. An analysis was also made by Dr. Brown of the mixture and some of the contents of the stomach, with the same result. The circumstance was reported to Mr. Grauhan, the chief constable, on Tuesday, May 19th, and he immediately

instituted an inquiry in order to ascertain whether either the cream of tartar or the magnesia contained arsenic. He was unable to discover that either contained poison; the magnesia, bought at another place, was certainly quite pure, and the cream of tartar, which Mr. Potter had in his possession, was certainly also pure, as found on analysis of both. The presence of arsenic could not, when subjected to the test, be detected in samples of cream of tartar which were obtained from his premises, and it was suggested that probably the bottle which contained the mixture of cream of tartar and magnesia might previously have contained arsenic. The matter remained shrouded in mystery up to Saturday last. On Thursday two persons, Mrs. Simpson and her son, a young man residing in Croft Street, Bradford, were taken suddenly ill. Dr. Lodge was called in, and he found they were suffering from the same symptoms of arsenical poisoning. They had both taken cream of tartar, and a portion of the ingredient was still preserved in the paper bought of Mr. Potter, and still labelled with his name. The cream of tartar was analysed by Dr. Lodge, and then by Dr. Brown and Dr. Goyder respectively, and found to contain a large quantity of arsenic. In order to make the result complete and satisfactory, ten grains of the cream of tartar was given to Mr. F. M. Rimmington, analytical chemist, and after an analysis, he reported that the cream of tartar contained arsenic to the extent of about 20 per cent. Further inquiry of Mr. Potter led to the discovery that on Tuesday, when Mr. Grauhan inquired, he had brought into use in his shop a new supply of cream of tartar, and that the cream of tartar sold on Saturday week to the family of Johnson, as well as to that of Simpson, belonged to a quantity (7 lbs.) which had been sold off on Tuesday. He was, of course, quite unconscious that it contained arsenic, and said that it must have been impregnated therewith when sent to him from the wholesale house from which he received it. We have been informed that the wholesale house alluded to deny that the mistake occurred with them. Mr. Grauhan, the chief constable, at once sent a telegram to the police authorities of the town whence the cream of tartar had been received by Mr. Potter, requesting them to visit the establishment, and seize any cream of tartar they might have in stock; and also had printed a placard for distribution through the West Riding, warning the public against the use of any cream of tartar purchased at Mr. Potter's since the 25th of April, the day on which the 7 lbs. of poisoned cream of tartar was received and offered for sale. Many persons were taken ill; but no fatal case has occurred.

Deaths from Chloroform.—An inquest has been held by Dr. Lankester, at Paddington, on the body of Selina Augusta Lord, a domestic servant, who had gone to Mr. Goddard, surgeon, for the purpose of having chloroform administered previous to a surgical operation. The chloroform was administered by Dr. Staples, of Seymour Street, who stated that he had given it in numerous cases during many years, without a single fatal case. Forty minims, afterwards increased to sixty minims, were administered on a handkerchief, when the head was observed to fall on one side, and the breathing ceased suddenly. Deceased was a very nervous, hysterical woman. The coroner observed that the chloroform appeared to have been administered with special care. Verdict: "Accidental death from the mortal effects of a dose of chloroform."

An inquest has been held at King's College Hospital, on John Lawrence, aged thirty-eight, who died from the effects of chloroform. Mr. Fergusson, surgeon, said he had performed an operation on the deceased in January last, when he used chloroform successfully. In the present instance it was administered in his presence, by one of the pupils, with the utmost care and caution. He took it at first without any particular symptoms. He afterwards became a little incoherent, and was convulsed. He was then allowed to breathe a little fresh air. The chloroform was again administered, the convulsive action still continuing, when suddenly he ceased to breathe. The usual remedies to resuscitate him were used, but in vain. He never offered any objection to the chloroform in his presence. He was satisfied the chloroform was the same in quantity and strength, and used in the same way as on the former occasion. The jury returned a verdict, "That the deceased died from chloroform properly administered."

Another case has occurred at Westminster Hospital, where an inquest has been held by Mr. Bedford, coroner, on the body of Jesse Robert G. Haile, aged thirty, who died under the influence of chloroform; administered previous to the removal of one of his fingers, by Mr. Holt, the house-surgeon. It was some time before deceased was fairly under the influence of the chloroform, when suddenly the pulse ceased and the face became discoloured. Artificial respiration and galvanism were tried for a considerable

time without success. It was found on the *post-mortem* examination of the body that both lungs were in a very unhealthy state, and there was fatty degeneration of the heart; and it was thought the shock of an operation would have been more dangerous than the chloroform. The jury returned the following verdict:—"That the deceased died from chloroform administered in a proper manner, previous to the amputation of the finger, which had been injured by accident."

Alleged Death from Arsenical Paper-Hangings.—Mr. Carttar held an inquest on Wednesday, May 27, at the Prince Alfred Tavern, Plumstead, on Thomas Dedman, aged five years. It appeared from the evidence that the deceased expired somewhat suddenly, and as he had been in the habit of sleeping with two other children of the same family in a room the walls of which had recently been covered with green paper, Dr. Wise gave evidence to the effect that in his opinion the deceased had been poisoned by inhaling the arsenic used in the preparation of the green paper. The jury returned a verdict to that effect.

Suicide by Prussic Acid.—On Saturday, May 30th, Joseph Medway, aged twenty-two, a medical student, lately residing in Penton Street, Kennington, committed suicide by swallowing a quantity of prussic acid. It appears that the deceased left home in his usual spirits on Friday, and returned at half-past eight, and, having procured a light, he proceeded to his bedroom. Not making his appearance, the bedroom door was forced, when he was found lying on the bed, dead.

Suicide by Arsenic.—An inquest has been held at the Marquis of Lansdowne Tavern, Thomas Street, Hackney Road, on Eliza Robinson, aged eighteen. Mrs. Charlotte Robinson said that deceased was on the point of being married to a young man, when he unexpectedly died about six weeks ago. Deceased was much attached to him, and his death seemed almost to make her distracted. On Sunday evening, May 31st, witness noticed that she was ill and retching, but she did not say what was the matter. At five o'clock the next morning she confessed that she had taken arsenic. Witness ran for a doctor, but before he could arrive she expired. The jury returned a verdict of "Temporary insanity."

Accidental Poisoning by Oxalic Acid.*—(Court of Queen's Bench, June 13th; before Lord Chief Justice Cockburn.) FARRELL *v.* POUND. Mr. Mills, Q.C., and Mr. F. H. Lewis appeared for the plaintiff; Mr. Huddleston, Q.C., and Mr. Prentice were for the defendant. This was an action brought by the widow of a labouring man, of 7, Poole's Place, Gray's Inn Lane, against a chemist and druggist carrying on business in Leather Lane, Holborn, to recover compensation for the loss of her husband, who at the time of his death was about fifty-five years of age, and earning, in constant employment, a guinea per week. It appeared that the deceased was in the habit of taking salts and senna; and on Saturday night, the 23rd of August, he and his wife, on returning from marketing, went into the defendant's shop, and asked for one pennyworth of salts and one pennyworth of senna. They were served with two packets; but on reaching home the plaintiff discovered that one packet did not contain senna, and to all appearance the contents of each were salts. She went back with both, but the shop was closed, and her husband, on her return, thinking both packets were salts, said he would take one of them. The plaintiff gave the smallest packet, and her husband became very ill, sick, and purged, and in ten minutes expired. It was then discovered that he had been poisoned, and that the packet contained oxalic acid. The other packet was really Epsom salts, and although the papers had printed upon them "Epsom salts" and "Oxalic acid—Poison" respectively, neither husband nor wife could read, and hence the lamentable mistake. On the part of the defendant, it was suggested that the poison was not supplied from Mr. Pound's shop; but it came out in the course of the trial that on the day after the death the defendant's attention was called to the unused packet being labelled with his name and address; and the learned judge, in summing up, said it was a great pity defendant's counsel should have been instructed to suggest that Mrs. Farrell was untruthful and inaccurate when she said she had purchased the packets at defendant's shop, while it was perfectly well known to the defendant, and quite clear, that she was correct in that statement. It was also suggested, on the part of the defendant, that the plaintiff had contributed to the death by her own negligence, as she must have taken up a packet of oxalic acid intended for another customer, instead of the packet of senna with which she

* The particulars of this case will be found in our number for October last, page 185.

was served; but Mr. Pound admitted that no customer afterwards came to him to say that he or she had asked for oxalic acid and received a packet of senna, which they did not want. Then it was urged that Mrs. Farrell ought to have noticed that the two packets were not wrapped in the same coloured paper. But the learned judge observed, in summing up, that it was rather too much to expect this poor woman to remember, at a distance perhaps of twelve months, that the last time she bought salts and senna of Mr. Pound they were served to her in wrappers precisely similar. The jury, without hesitation, found a verdict for the plaintiff—Damages £100.

DEATH OF DR. NELIGAN, OF DUBLIN.

We regret to have to announce the death of Dr. Neligan, which occurred on Thursday, the 23rd of July, in the forty-eighth year of his age. Dr. Neligan had attained to a high position in his profession; he was the author of a popular work on 'Medicines, their Uses and Mode of Administration.' He had contributed several articles to this Journal, and he was Chairman of the Jury in Class 2, Section B., "Medical and Pharmaceutical Products and Processes," at the International Exhibition last year.

BOOKS RECEIVED.

The Progress of Ophthalmic Surgery, from the Invention of the Ophthalmoscope (in 1851) up to the Present Time. Being an Oration Delivered before the North London Medical Society on February 11, 1863. By John Zachariah Laurence, F.R.C.S., etc. London: Printed by Henry Mitchener, Eversholt Street. 1863.

The Half-Yearly Abstract of the Medical Sciences: January to June, 1863. London: John Churchill, New Burlington Street. Edinburgh: Maclachlan and Co. Dublin: Fannin and Co.

TO CORRESPONDENTS.

Patent Medicine Licence.—We remind our readers that this licence expires on the 1st of September, and must be renewed within one month from that time.

Wanted copies of the May, June, July, and August numbers of the Journal, 1852, for which the publishing price will be paid by Mr. Bremridge, 17, Bloomsbury Square, W.C.

A Constant Reader (Oxford).—We are not aware that beer made from sugar in place of malt is always "cloudy." When such is the case, the beer should be *fined* with a little isinglass.

B. W. (Torpoint).—The dose of santonine is generally from one to five grains. We know of no easier method of preparing it than that referred to.

C. W. S. (Camden Town) wishes for the formula for "Danns' mixture for bowel complaints," with which we are not acquainted.

Nil Desperandum (Wales).—Re-distillation will effect the object.

A. B. (Dover).—The terms are synonymous.

A Member (Carmarthen).—Amber is rather difficult of solution, and requires to be previously heated in an iron pot, over a clear red fire, till it softens. Drying linseed oil, previously heated, is now to be poured in and well stirred, in the proportion of ten ounces to one pound of amber. After the incorporation is complete, and the liquid slightly cooled, a pound of oil of turpentine should be added. See also Ure's 'Dictionary of Arts, Manufactures, etc.'

J. E. G. (Aberdare) is thanked for the "curiosity in pharmacy."

Instructions from Members and Associates respecting the transmission of the Journal before the 25th of the month, to Elias Bremridge, Secretary, 17 Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Mr. Churchill, New Burlington Street. Other communications to the Editors, 17, Bloomsbury Square.

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. V.—No. III.—SEPTEMBER 1st, 1863.

THE QUALIFICATION REQUIRED AND THE CONTROL TO BE EXERCISED.

It is satisfactory to find that at least as far as outward demonstration goes, chemists and druggists of all classes now agree in advocating the association of members of their trade for the protection and promotion of their common interests, for the elevation of their social position, for the advancement of the technical and scientific knowledge involved in their professional occupations, and for the fulfilment of conditions required for the public good. These objects have for many years received a practical recognition and support from the members of the Pharmaceutical Society, who have devoted time and talents and pecuniary means of no small amount in carrying them into effect and recommending them to the favourable notice of their brethren throughout every part of the country.

That much good has resulted from the efforts thus made no one will deny. The members of the drug-trade (we use the term in its most comprehensive sense) are, as a body, better qualified for their occupations, they occupy a higher social position, and they are more generally recognized as an important link between the patient and the medical prescriber, than was formerly the case. Nor is this improvement confined to those with whom it originated and who have been the principal agents in promoting it. The public advocacy of pharmaceutical education which the Pharmaceutical Society has never failed to promulgate, and the liberal means for imparting pharmaceutical knowledge which that Society has established and maintained at so great a cost, have indirectly as well as by direct means contributed to a general advancement in pharmaceutical learning. Even those who have refused to admit the importance of the measures adopted, or to support the means by which improved education has been provided for pharmaceutical practitioners, have nevertheless been compelled, from very shame, to keep pace, to some extent at least, with the general advancement. The improvement that has taken place cannot, therefore, be estimated by comparing the qualifications of the supporters of the improved system with those of others, nor even by observing the efficiency with which the duties of a pharmaceutical establishment are performed by those engaged in it, for a higher class and greater extent of knowledge are required now than were formerly. The large number of new remedies that have been introduced call for the exercise of a more extended acquaintance with chemical and botanical terms, as well as other information relating to these substances, without which the ordinary routine of business could not be conducted.

That the good that has hitherto been effected has fallen short of what was

anticipated by some of the ardent promoters of the movement may be admitted, and this is sometimes referred to by lukewarm supporters as evidence of the failure of the undertaking. But on the other hand we have a greatly extended recognition, by those who hitherto have remained inactive or have been looked upon as opponents, of the necessity of making professional knowledge, as tested by examination, an essential qualification for membership in an association aiming at objects similar to those we have described. With regard to the fundamental principles upon which such an association should be established, there appears now to be no difference of opinion, although different views are entertained respecting the nature and amount of the qualification that should be required. By some it seems to be thought that we should limit the required qualification to such practical knowledge as may be acquired in the ordinary routine of business. By others it is considered that although such purely technical knowledge would be sufficient in many cases, yet that there should be a higher grade of practitioners possessing in addition a scientific qualification. Others again consider that a sound and sufficient pharmaceutical qualification must have a scientific basis, and involves the systematic study of chemistry and pharmacy, botany and materia medica. Then, among the advocates for these different kinds of qualification, there are differences of opinion with regard to the amount of knowledge that should be required on the several subjects. There are those who would at once, or who at least would now, after the lapse of twenty years, during which time examinations have been conducted and scientific instruction afforded by the Pharmaceutical Society, make the qualification all that could under any circumstances be required or reasonably expected; while others think that too much has been attempted and is even now required, and they are disposed to be for the present very lenient, although at some future time they would justify a strict examination.

Notwithstanding this conflict of opinion, and the frequent reference made by correspondents in this and other journals to the subject of pharmaceutical qualification and examinations, we have neither seen nor heard anything to show that the system which has been established and is now in operation is very defective or susceptible of much improvement. The examinations of the Pharmaceutical Society have been consistently and successfully conducted for twenty years, without any just complaint having been preferred, or any dissatisfaction, that we have ever heard of, created. These examinations are of a thoroughly practical nature, and any man who understands the practice of pharmacy in all its details, and has devoted some attention to the systematic study of chemistry and botany, and their applications in pharmacy and materia medica, ought to be able easily to pass them. When first instituted, they were less stringent than they have subsequently become; but even now, the chief importance is attached to practical rather than merely scientific or theoretical knowledge.

If the new Medical Bill, with its provisions relating to pharmacy, should be carried into effect, the whole subject of pharmaceutical examinations and qualification will be likely to occupy a good deal of attention among the medical and pharmaceutical public. Propositions may be made for some alterations in the present system, and the different opinions to which we have referred may be expected to have their advocates, who will contend for the establishment of their favourite systems.

In carrying out a system of education and examination for regulating the qualification of practitioners in any profession or art, it is very important, not only that sound judgment should be exercised in determining the nature of the qualification to be required, but also, and especially, that the course pursued should be consistent and uniform throughout. In such cases change or rumours of change cannot fail to produce prejudicial effects, by unsettling the determinations of those who are preparing for examination. It is necessary that a con-

trolling power should be exercised by somebody, but at the same time very desirable that it should not be subject to popular influences, and that individual or class interests or prejudices should not affect its decisions.

In the new Medical Bill, it is proposed that the regulation and control to be exercised over the qualification and examination of practitioners in pharmacy, as well as in every other department of medicine, should be vested in the Medical Council. This does not imply any attempt at interference with the regulations for the management of trade associations having a view to mutual protection and improvement, and the general advancement of the interests of the body, but it aims at the production of a comprehensive, complete, and consistent system of education and examinations, which shall tend to ensure a sufficient qualification among practitioners in every department of medicine, and thus contribute to the safety and welfare of the public.

"THE ERROR AND THE REMEDY."

In our last Journal we published a letter from Mr. Barling on "*The Error and the Remedy.*" "The Error" on which he treats is the course pursued by the Pharmaceutical Society from its commencement to the present time; he asserts that "*we have aimed a great deal too high all at once, and have quite overshot our mark;*" that, instead of "*a good practical knowledge of the drugs in which they deal, and of the language in which prescriptions are written,*" we have required of candidates for admission to our Society "*a theoretical knowledge of many other things besides;*" that we have been "*trying to obtain a full-fledged, vigorous Society all at once, instead of letting it grow naturally.*" Surely Mr. Barling, who describes himself as an old member of the Society, must have forgotten that at its commencement chemists in business were enrolled as members, and assistants and apprentices as associates, without examination; that at the first establishment of the examinations they were extremely lenient, and that greater stringency has only been introduced very gradually, and as justified by the increased facilities for Pharmaceutical education, and, we may add, the greater amount of it possessed by chemists generally. These are facts which, if our correspondent had watched the course of the Society, must have been obvious to him; for the present requirements, we feel assured that the Board of Examiners would be only too happy to receive a visit from him when engaged in their labours, that he would leave them fully convinced of the *thoroughly practical* nature of the examination as now conducted, and satisfied that a theoretical knowledge of subjects unconnected with the drugs in which we deal is not required of candidates who seek certificates of fitness to undertake the responsibilities of pharmaceutical chemists.

The consequences of the error, according to Mr. Barling, are—*that pharmaceutical chemists bear but a small proportion to druggists in general; that outsiders are quite shut out; and that our legislators will not allow of any exclusive legislation by which an examination, far beyond the present attainments of the bulk of those interested, will be made compulsory.*

To this we answer, that there is nothing in our constitution or arrangements which shuts out men who possess such an amount of education as the Pharmacy Act requires, and Mr. Barling states in his letter to be essential; that if our legislators will not render such an examination compulsory, we have abundant evidence that they deem it necessary, and make the passing it a title to privileges much coveted by the "outsiders,"—privileges which have aroused those who, so

long as we possessed no special rights beyond a distinctive name, could see no advantage in an educational qualification, to adopt one now as the only plea on which they can ask for recognition.

And what are the remedies which our correspondent, after so much consideration, proposes

1st. To obtain a new Act making membership compulsory, and establishing two grades.

2nd. To invite all men now engaged in the business to have their names enrolled.

3rd. To reduce the subscription to 10*s*., and discontinue the Journal.

4th. To make apprenticeship, as well as educational qualification, essential to admission; the latter to be made gradually more stringent.

We have hinted before that Mr. Barling could not have watched the course of the Society; but when we find that his remedies are in the main but copied from its conduct, only making its rules more exclusive, we are inclined to retract that opinion, and think rather that he sought on the one hand to impress "outsiders" with the utter worthlessness of the Society of which he has been so long a member, and, on the other, to frighten intending candidates for examination by an erroneous and extravagant description of the difficulties in their way.

Amongst our correspondence of this month will be found a letter from Mr. Hornsby on the foregoing subject; we commend it to our readers as worthy of special consideration.

To our mind, the recommendation of the remedy disproves the error, rendering comment on the letter almost unnecessary; but our Society is recruited from the junior members of the trade, men who have not had the opportunity of watching its progress, and we cannot therefore leave them to infer from our silence that we acquiesce in Mr. Barling's opinions.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *August* 5, 1863,

Present—Messrs. Bird, Davenport, Deane, George Edwards, Hanbury, Haselden, Hills, Morson, Proctor, Reynolds, Sandford, Savage, and Waugh,—the following were elected

MEMBERS.

William Adolphus Rolfe............................BATH.
John Bray ....BISHOP STORTFORD.
John Brunt Mackey.................................LONDON.

The Reports of the Professors and the Director of the Laboratory were read, and the Sessional Prizes and Certificates awarded.

BENEVOLENT FUND.

The sum of Twenty Pounds was granted from this Fund to the aged widow of a late Member in the West Riding of Yorkshire.

MAJOR EXAMINATION, *19th August*, 1863.

(*Registered as "Pharmaceutical Chemists."*)

Brayshay, Thomas ....Stockton-on-Tees.
Hicks, James Sellick ....East Looe.
Miller, Thomas Henry ....Crediton.

MINOR EXAMINATION.

(*Registered as "Assistants."*)

Browne, Thomas Llewelyn.........................Chester.
Dawson, Oliver Robert ....Southampton.
George, William ....Newcastle Emlyn.
Heathorn, William ....Maidstone.
Millar, Frederick Charles Moss ....Beaminster.
Squire, Alfred Rook ....Bristol.
Warren, George Robert............................Ware, Herts.

REGISTERED APPRENTICES.

NAME.	RESIDING WITH.	ADDRESS.
Gorton, Charles	Mr. Gorton	London.
Lane, Elihu B.	Mr. Judd	Christchurch.
Manby, Walter Edward	Mr. Manby	Southampton.
Sartin, Samuel Robert	Mr. Anderson	London.
Sewell Allen.		

*** The Prizes and Certificates will be distributed at the evening meeting on the 7th October next, when the successful competitors will be expected to attend.

ORIGINAL AND EXTRACTED ARTICLES.

NEW AMERICAN REMEDIES.

BY PROFESSOR BENTLEY, F.L.S., HONORARY FELLOW OF KING'S COLLEGE, LONDON.

(*Continued from p.* 25.)

XII. CERASUS (PRUNUS) VIRGINIANA, *MICHAUX.*—WILD CHERRY, WILD BLACK CHERRY.

HISTORY.—Wild-cherry bark is regarded by the most competent writers on medicine and therapeutics in the States of North America, as one of the most important of their indigenous remedies. It is extensively employed by the regular medical practitioners as a tonic and sedative, and is regarded as more especially valuable in local or general debility of the system, attended with irritation. In domestic practice its reputation is also very high. A resinoid extract obtained from it, and which is called *Prunin*, is also much used by the Eclectic practitioners. Wild-cherry bark was introduced into the United States Pharmacopœia in 1820, where it is still retained, and formulæ given for some of its preparations. At present it has not been much employed in this country, except in certain localities, but those who have given it a fair trial speak favourably of its virtues. From the high testimony of its valuable properties borne by American writers, we cannot doubt but that it is a remedy worthy of an extended trial in this country.

SYNONYMS.— Various names have been given by botanists to the plant which is officinal in the United States Pharmacopœia, and hence it is most important that there should be no doubt as to the one thus ordered to be employed. It is

the *Cerasus virginiana*, Michx. Fl. Bor. Amer. vol. i. p. 283, and Michx. N. Amer. Fl. Syl. vol. ii. p. 205, tab. 88. It is the *Cerasus serotina*, De Cand. Prod. vol. ii. p. 540; Ehrh. Beit. vol. iii. p. 20; Loisel, in Duhamel, ed. nov. 5, p. 3; and of Torrey and Gray's Fl. N. Amer. vol. i. p. 410. It is the *Prunus serotina*, Willd. Spec. ii. p. 986, and Arb. t. 5, f. 2, p. 239; and the *Prunus virginiana*, Mill. Dict. n. 2. It should be particularly noticed that the *Prunus virginiana*, Linn., is not this plant at all, but the Choke Cherry, *Cerasus virginiana*, De Cand., and Torr. and Gray, vol. i. p. 410; a species which is nearly allied to our common Bird Cherry, *Cerasus Padus*, De Cand. To avoid confusion, it would be better to adopt the name of *Cerasus* or *Prunus serotina*, but as it is officinal in the United States Pharmacopœia under the name of *Prunus virginiana*, and is commonly applied for under that name, we have used both it and the generic one *Cerasus* as a heading to this paper. In common language it has been termed Wild Cherry, Black Cherry, Wild Black Cherry.*

Etymology.—The origin of the generic name *Prunus* is wholly unknown. According to Theophrastus, it is named in Greek προύνη. The name of *Cerasus* is derived from a town of the same name in Pontus, in Asia, whence the cherry has been commonly supposed to have been originally obtained. The specific name *virginiana* is evidently derived from the district in which it was at first known to flourish; that of *serotina* is from the Latin word *serotinus*, signifying late, a name applied to this species on account of the late ripening of its fruit. The origin of the common names of Wild Cherry, Wild Black Cherry, and Black Cherry is at once evident.

BOTANY.—The genera *Cerasus* and *Prunus*, which are very closely allied, indeed frequently included in the same genus by botanists, are placed by Lindley† in the Natural Order Drupaceæ. De Candolle, in his 'Flore Française,'‡ also placed them in the same Order. Jussieu originally put them into the Order Rosaceæ, Suborder Amygdaleæ; De Candolle, in his 'Prodromus,'§ follows Jussieu's arrangement, which is the one now generally adopted by botanists.‖

Generic Character.—The proper name of this species, as already stated, being *Cerasus serotina*, the following characters apply to that genus and species. CERASUS.—*Leaves* conduplicate in vernation. *Pedicels* 1-flowered or ramose. *Calyx* inferior, bell-shaped, deciduous, 5-partite. *Petals* 5, spreading. *Stamens* 15–30. *Ovary* superior. *Drupe* globose or umbilicate at the base, fleshy, quite smooth, and without bloom; *stone* (*putamen*), somewhat globose, smooth.¶

Specific Character.—*Tree* varying in height from twenty-five to eighty or more feet. *Leaves* somewhat coriaceous, oval-oblong or lanceolate-oblong, 2–4 inches long, acuminate, glabrous, or bearded along the midrib beneath, smooth and shining above, finely serrated with adpressed or incurved callous teeth; *petioles* (or base of the leaf) mostly with two or more glands. *Racemes* elongated, 2–5 inches in length, nodding at their termination. *Flowers* small, white, fragrant. *Petals* broadly obovate. *Drupes* globose, purplish-black, and shining when ripe, and about the size of a pea, edible, although having a slightly astringent, bitter taste.**

Habitat.—This species is found more or less plentifully distributed in nearly all the States of North America. According to Wood and Bache,†† "this tree

* Torrey and Gray's 'Flora of North America,' vol. i. p. 410; Gray's 'Genera of the Plants of the United States,' vol. iii.; and De Candolle's 'Prodromus,' pp. 539 and 540.

† 'Vegetable Kingdom,' p. 557.

‡ Vol. iv. p. 479 (1805).

§ De Candolle's 'Prodromus,' vol. ii. pp. 532-535.

‖ Bentley's 'Manual of Botany,' pp. 533-535.

¶ Lindley's 'Flora Medica,' pp. 222–223, and 'Medical and Economic Botany,' pp. 181 and 182; De Candolle's 'Prodromus,' vol. ii. pp. 532 and 535.

** De Candolle's 'Prodromus,' vol. ii. p. 540; Torrey and Gray's 'Flora of North America,' vol. i. p. 410.

†† 'United States Dispensatory,' 11th edit. p. 627.

grows throughout the Union, flourishing most in those parts where the soil is fertile and the climate temperate, and abounding in the Middle Atlantic States, and in those which border on the Ohio. In the neighbourhood of Philadelphia it affects open situations, growing solitarily in the fields and along fences, and seldom aggregated in woods or groves. It is highly valued by the cabinet-makers for its wood, which is compact, fine-grained, susceptible of polish, and of a light-red tint, which deepens with age. The fruit has a sweetish, astringent, bitter taste; and is much used in some parts of the country to impart flavour to spirituous liquors." It flowers in May, and ripens its fruit in the Northern States in August and September.

Collection, etc.—The part of this plant which is employed in medicine is essentially the inner bark (see General Characteristics, below). This is obtained indiscriminately from all parts of the tree, although that of the root is commonly regarded as the most active. From experiments, made by Mr. J. S. Perot,* it appears that the bark collected in autumn is stronger than that obtained in the spring. Thus, 1000 grains of bark collected in April, yielded 0·478 grains of hydrocyanic acid; the same quantity of bark obtained in June, yielded 1·007 grains of hydrocyanic acid; and from a similar weight collected in October, he obtained 1·436 grains of hydrocyanic acid. Hence it appears that the best time for collecting the bark is about the end of October. From the experiments of Mr. Perot† it also appears that the bark should be preferred when recently dried, as it deteriorates by keeping.‡

General Characteristics.—Wild-cherry bark, as found in commerce, consists essentially of the inner layers (*derm*) of the bark only, but varying-sized portions of the outer bark (*periderm*) are commonly attached to these inner layers. It occurs in nearly flat, or slightly curved or arched pieces, of various sizes. In length, the pieces of bark vary from about one inch to six inches or more, a common size being about four inches; and in breadth, from about half an inch to three inches or more, averaging about one inch and a half. The average thickness of the pieces which consist entirely, or nearly so, of the inner bark, is from one-tenth to one-eighth of an inch, but in some cases it is much less than this. In those pieces or portions of pieces where the outer layers of bark (*periderm*) are attached, the thickness is more considerable, being sometimes nearly a quarter of an inch.

The pieces vary in colour and other characteristics externally, according to their size, and the presence or absence of periderm, etc. Thus, those which are principally composed of inner bark present a reddish-brown colour, and may be seen to consist of cross fibres, between the interstices of which the soft cellular matter is placed, the whole being more or less rough to the touch. When the periderm is attached, the pieces are of a rougher character, and in such parts of the bark the colour is redder, and sometimes spotted at intervals with portions of greyish, silvery-white, or brownish patches. Some of the smaller pieces present a uniform reddish-yellow appearance, and are nearly smooth externally. Internally, the bark has a deep yellowish-brown or reddish-brown colour, the larger pieces being the more red. It has a more or less roughened character according to the size of the pieces, and consists of irregular fibres crossing each in a diagonal direction. Projecting from the inner surface of the bark may be also observed the ends of numerous fibres, and on some of the pieces are to be found portions of the wood, which are of a yellowish-white colour, and perfectly smooth.

The longitudinal fracture of the inner bark is close, and presents a yellowish-grey colour, interspersed with reddish spots and stripes. The transverse frac-

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* Amer. Journ. Pharm. new ser. vol. xviii. April 1852, p. 110. † Idem p. 111.

‡ Wood and Bache's 'United States Dispensatory,' 11th edit. p. 627.

ture is close, although somewhat rough and fibrous, and of a more reddish hue than the longitudinal. The longitudinal and transverse fractures of the periderm are closer and denser than the similar fractures of the inner bark. The bark generally, has a somewhat spongy texture, particularly the inner layers; it is readily powdered, and the powder has a deep fawn colour. It has a bitter, somewhat aromatic, and rather agreeable taste; but scarcely any perceptible odour in a dried state, although, when fresh, it reminds one of that of the essence of bitter almonds, or of peach-leaves.

COMPOSITION AND CHEMICAL CHARACTERISTICS.—The first analysis of this bark of, in any degree, a satisfactory nature, was made by Mr. Stephen Proctor,* who found it to contain *starch*, *resin*, *tannin*, *gallic acid*, *fatty matter*, *lignin*, *red colouring-matter*, *volatile oil*, *hydrocyanic acid*, *salts of lime and potassa*, and *iron*. By repeated distillation of the same portion of water with several different portions of the bark, Mr. Proctor obtained a volatile oil analogous in its properties to the volatile oil of bitter almonds, and like it associated with hydrocyanic acid. This oil, in the dose of two drops, proved fatal to a full-grown cat in less than five minutes. Professor William Procter has since shown that the volatile oil and hydrocyanic acid do not exist ready formed in the bark, but are products of the decomposition of *amygdalin*, which he proved to be one of its constituents.† Hence it seems clear, that another principle analogous to, if not identical with *emulsin*, must be also present in the bark, as such a substance is necessary for the above decomposition to take place. The sedative action which the bark exerts on the heart depends essentially upon the hydrocyanic acid which it yields. The essential oil of wild cherry, when deprived of hydrocyanic acid by distillation with a mixture of protochloride of iron, potassa, and water, is without any poisonous properties.‡

Dr. Lee,§ in an article on Indigenous Tonics, has given the following more elaborate analysis of wild-cherry bark, which he states was made in the laboratory of the Messrs. Tilden, of New York State, North America:—

		Per cent.
Organic matters	6476·04	92·500
Inorganic matters	523·96	7·500
Total	7000·00	100·000
Albumen	263·00	3·757
Gum	131·57	1·878
Starch	164·00	2·342
Extractive	152·96	2·185
Tannin	70·56	1·008
Sugar	62·24	0·889
Colouring matter	612·76	8·742
Particular nitrogenised principle	152·32	2·716
Red resin, soluble in alcohol	297·28	5·675
Red resin, soluble in ether	171·52	2·450
Soluble salts	38·72	0·553
Insoluble salts	486·24	6·947
Lignin, etc.	4396·83	60·858
Total	7000·00	100·000

Wild-cherry bark was at one time supposed to contain *phloridzine*, a bitter

* Amer. Journ. Pharm. vol. vi. p. 8.

† Amer. Journ. Pharm. vol. x. p. 197; and Wood and Bache's 'United States Dispensatory,' 11th edit. p. 628.

‡ Pereira's 'Materia Medica and Therapeutics,' vol. ii. part 2, 4th edit. p. 281.

§ Amer. Journ. Mat. Med. vol. ii. p. 284.

principle found in the bark of the apple, pear, and of some other allied trees, but Mr. Perot* failed completely to detect any indications whatever of that principle. It is still a question, however, whether the bark does or does not contain a bitter principle distinct from amygdalin, and to which its tonic properties are essentially due. Dr. Wood† believes that it does, and his opinion is borne out by the experiments of Professor Procter,‡ who found that an extract of the bark retained its bitterness after the whole of the amygdalin had been removed. It would appear, therefore, that the sedative properties of the bark depend upon the hydrocyanic acid which it yields; and its tonic properties essentially, upon some undiscovered bitter principle, assisted probably by some undecomposed amygdalin. The more valuable therapeutic properties are said by Dr. Grover Coe§ to reside in a neutral proximate principle called *Prunin*. The author of 'Positive Medical Agents'‖ says that "*prunin*, the active resinoid principle of *Prunus virginiana*, is a snuff-coloured powder, with a pleasant, rather aromatic odour, and a rather unpleasant feeble taste, which becomes bitter as the article is held for a longer time in the mouth." Nothing of a satisfactory nature is known among reliable authorities, however, of the nature of this so-called active principle.

An infusion of the wild-cherry bark, bruised, in the proportion of one ounce to twenty-four ounces of boiling water, and allowed to macerate for twenty-four hours, had a pale reddish-yellow colour, resembling that of Madeira wine, a somewhat opalescent appearance; an agreeably bitter, faintly aromatic taste; and an odour resembling that of a weak solution of the essential oil of bitter almonds, or that of bruised peach-leaves. It exhibited the following reactions:—*Blue litmus paper* was slightly reddened by it, but the change was not very evident; *tincture of iodine* produced a dirty-yellow turbidity, and an abundant cinnamon-brown precipitate; *solution of persulphate of iron* caused a deep greenish-bluish black coloration, and an abundant dirty-brown, light precipitate; *solution of perchloride of iron* a deep bluish-black coloration, and a very abundant dirty-brown precipitate; *solution of ferrocyanide of potassium* only slightly deepened the colour of the infusion; solution of *ferridcyanide of potassium* formed slowly a yellowish, light precipitate; *solution of chromate of potash* perceptibly reddened the colour of the infusion, but caused no precipitate; *solution of potash* also changed the colour to a deep brownish-red, but without forming a precipitate; *solutions of antimoniate of potash*, and *carbonate of potash* also reddened the colour, but caused no precipitate; *solution of baryta* reddened the colour, and ultimately produced a plentiful reddish-yellow, light precipitate; *solution of nitrate of silver* had no marked effect at first, but ultimately a dirty yellowish-brown precipitate was formed; *solution of gelatine* changed the colour to a milk-white, and produced an abundant curdy, somewhat pinkish-coloured precipitate; *solution of acetate of lead* caused the infusion at first to assume a milky appearance, but it ultimately became quite clear and colourless from the deposition of an abundant yellowish-white, very light, gelatinous-looking precipitate; *solution of basic acetate of lead* produced a yellowish-brown milky appearance in the infusion, which slowly deposited a very light, plentiful precipitate; *solution of bichloride of mercury* turned the infusion milky, and produced slowly, a plentiful, whitish, very light precipitate; *solution of chloride of lime* changed the colour at first to a deep brownish-black, but afterwards the colour became slowly discharged, and a plentiful, whitish-brown

* Amer. Journ. Pharm., new ser. vol. xviii. p. 111.
† Wood's 'Therapeutics and Pharmacology,' vol. i. p. 291; and Wood and Bache's 'United States Dispensatory,' 11th edit. p. 628.
‡ Amer. Journ. Pharm., vol. xxviii. p. 108.
§ 'Concentrated Organic Medicines,' p. 391.
‖ 'Positive Medical Agents,' p 223.

light flocculent precipitate was produced; *sulphuric acid* had no marked effect at first, but it produced ultimately a dirty yellowish-brown precipitate. No very evident effects were produced in the infusion by the addition to it of either *nitric*, *acetic*, or *hydrochloric acids;* nor by *tincture of galls;* nor by the *solutions of ammonia*, *nitrate of baryta*, *sulphate of copper*, *sulphate of soda*, *bichloride of platinum*, *protochloride of tin*, *chloride of calcium*, *sulphate of lime*, or of that of *oxalate of ammonia*.

Upon applying *sulphuric acid* to the freshly-fractured surface of the bark, it became brighter red. The addition of *nitric acid* in like manner, also reddened the surface at the moment of contact. By the application of *hydrochloric acid* to the fractured surface of the bark, the reddish portions became somewhat more evident, but the change was not very marked. No very evident effect was produced by the application of *solution of ammonia* to the freshly-fractured surface of the bark.

We have given the reactions of the infusion of wild-cherry bark thus in detail, for the purpose of assisting those ignorant of its characteristics, in recognizing and distinguishing it readily from other drugs; and also from the belief that it will be much used in this country by medical practitioners, for the object of guiding them in its administration, and combination with other medicines.

MEDICINAL PROPERTIES AND USES.—The following extracts from American writers on materia medica and therapeutics will show the estimation in which *wild-cherry bark* is held in North America. Dr. Wood* thus speaks of its properties and uses:—"This bark is among the most valuable of our indigenous remedies. Uniting with a tonic power the property of calming irritation and diminishing nervous excitability, it is admirably adapted to the treatment of diseases in which debility of the stomach, or of the system, is united with general or local irritation. When largely taken it diminishes the action of the heart, an effect ascribable to the hydrocyanic acid. Dr. Eberle found copious draughts of the cold infusion, taken several times a day, and continued for nearly two weeks, to reduce his pulse from seventy-five to fifty strokes in the minute. The remedy is highly useful, and has been much employed in this country in the hectic fever of scrofula and consumption. In the general debility which often succeeds inflammatory diseases, it is also advantageous; and it is well adapted to many cases of dyspepsia. It has been given successfully in intermittent fever, but is much inferior to cinchona."

Dr. Lee† thus speaks of its value in the treatment of tubercular consumption:—"Of all the tonics that have been recommended for this disease, no one possesses so many valuable properties as the cherry bark, in the form of cold infusion. The amount of hydrocyanic acid developed in the infusion is sufficient to allay, in a good degree, the cough and morbid irritability present, while its tonic properties invigorate the stomach, and give tone to the whole digestive system. As an indirect result, the cough is abated and the colliquative sweats greatly lessened, while the appetite is improved, and diarrhœa arrested. We do not say that these effects will always follow. There may be pathological conditions present which preclude all hope of essential benefit from any remedial agencies. But under favourable circumstances, before the disease has made great progress, and the tubercular deposition become extensive, such effects are often witnessed, and may be very confidently anticipated. No other single remedy, indeed, can be named which, while it exerts a soothing effect upon the cough, exerts so general a tonic influence over all the functions, not only without aggravating, but manifestly ameliorating any complications which may appear in the course of the malady. Nor can its beneficial effects be attained, to an equal degree,

* Wood and Bache's 'United States Dispensatory,' 11th edit., p. 628.
† 'American Journal of Materia Medica,' vol. ii. p. 289.

by any artificial combination of a supposed similar kind. We may add diluted hydrocyanic acid, or cherry-laurel water, or some of the other narcotic or sedative articles, to a bitter tonic infusion, and we may further flavour them with *noyau*, almond emulsion, or any similar substance, and still we shall find that they yield in efficacy to nature's own combination, effected in her own laboratory." Dr. Wood* also refers to its value as a remedial agent in the treatment of *pulmonary consumption*. He also adds, "I have employed this remedy much in *functional and organic disease of the heart*, attended with a frequent, perhaps irregular, but rather feeble pulse, with an anæmic or otherwise debilitated state of system; and consider it one of our best remedies in such cases, combined, if anæmia exist, with the use of the chalybeates. As the infusion, however, contains tannic acid, it is better not to add the preparation of iron to it, but to administer the two separately."

The author of the article on *Prunus virginiana* in the 'Lancet'† says, "Wild-cherry bark exerts three remarkable and valuable actions on the system: it is (1) powerfully tonic; (2) calmative of nervous irritability; and (3) an arterial sedative. We have seen most of its employment in the form of a saturated tincture. This, in doses of one drachm, affords relief in a most striking manner in the dyspepsia of highly-nervous persons. Such patients, when under the influence of depressing emotions, complain of a peculiarly distressing sensation of sinking and pain at the pit of the stomach; a similar sense of distress often attends pulmonary consumption; and no agent in either case affords so much relief as the tincture of wild-cherry bark. In gastralgia (whether before or after taking food), in flatulence, heartburn, nausea, or other symptoms of irritation of the stomach, it is equally remedial. In general debility and the depression following catarrhs and influenza, it is a valuable tonic and restorative."

The so-called active constituent of wild-cherry bark, which has been termed *prunin*, Dr. Grover Coe‡ regards as "a valuable stimulant tonic, and expectorant, when given in small and repeated doses; and an arterial sedative of considerable efficacy when given in larger doses." He adds, it may be employed in coughs, colds, incipient phthisis, dyspepsia, hectic fever, debility, scrofula, etc. The author of 'Positive Medical Agents'§ thus speaks of Prunin:—"It possesses the virtues of the plant, viz. tonic, and pleasantly stimulating to the digestive organs, and, while it is such, exercising a marked influence over the force of the circulation. It has been found beneficial in the treatment of pulmonary disease, especially of a bronchial character, and in phthisis, when hectic fever is present." The above extracts, and a host of others, might have been given from reliable authorities, clearly indicate that the wild-cherry bark is a remedy of much value, and as such, cannot but come into use into this country.

Administration, Preparations, and Doses.—Wild-cherry bark has been administered in the form of powder, infusion, fluid extract, resinoid extract (*prunin*), tincture, wine, syrup, etc. The powder is but rarely employed, as it is liable to oppress the stomach, and is moreover not in a favourable condition to undergo those chemical changes which are absolutely necessary to produce the full remedial effects of the remedy. The resinoid extract (*prunin*), might probably with advantage be substituted for the powder in those cases where it is considered necessary to order the bark in that form, as it is a more concentrated remedy than it, being free from starch, gum, sugar, woody fibre, etc. Prunin, however, possesses but slightly the sedative effects of wild-cherry bark, as from the volatility of hydrocyanic acid, this is driven off in its preparation. It possesses only the tonic and anti-periodic properties of the bark.

* Wood's 'Therapeutics and Pharmacology,' vol. i. p. 291.
† 'Lancet,' vol. i. 1862, p. 159.
‡ 'Concentrated Organic Medicines,' p. 391.
§ 'Positive Medical Agents,' p. 223.

The infusion made with cold water is, in the majority of cases, regarded as the most reliable and appropriate form for administration. The infusion made with boiling water is objectionable in two ways: firstly, by coagulating the *emulsin*, and thus rendering it inert; and secondly, by driving off the volatile hydrocyanic acid, if any should be formed. For similar reasons a decoction would be even more objectionable.

The following are forms for the more important preparations of wild-cherry bark:—

INFUSUM PRUNI VIRGINIANÆ, U. S.; *Infusion of Wild-Cherry Bark.*—Take of wild-cherry bark, bruised, *half an ounce;* cold water, *sixteen fluid ounces.* Macerate for twenty-four hours, and strain.

Dr. Wood * states, that "the infusion of wild-cherry bark is one of the preparations to which the process of percolation or displacement is well adapted. In this way the virtues of the bark can be more rapidly and thoroughly exhausted than by maceration alone. When properly made, it is beautifully transparent, has the colour of Madeira wine, and the agreeable bitterness and peculiar flavour of the bark."

SYRUPUS PRUNI VIRGINIANÆ, U. S.; *Syrup of Wild-Cherry Bark.*—Take of wild-cherry bark, in coarse powder, *five ounces;* sugar (refined), *two pounds;* water (cold), *a sufficient quantity.* Moisten the bark thoroughly with water, let it stand for twenty-four hours in a close vessel, then transfer it to a percolator, and pour water upon it gradually until *sixteen fluid ounces* of filtered liquor is obtained. To this add the sugar, in a bottle, and agitate occasionally until it is dissolved.†

This is said to be a very agreeable and active preparation. It is based upon a formula proposed by Messrs. Procter and Turnpenny.‡

The above are the only officinal preparations in the United States Pharmacopœia. The following are however in some use, and hence we subjoin formulas for their preparation.

Fluid Extract of Wild-Cherry Bark.—The following process is proposed by Professor Procter:§—Macerate *twenty-four troy ounces* of the powdered bark in *thirty-two fluid ounces* of alcohol of *eighty-eight per cent.* for eight hours; put the mixture into a percolator, and add alcohol until *four pints* (Ph. Lond.) have passed; evaporate the tincture thus made to a syrupy consistence, then add *eight fluid ounces* of water, and again evaporate until all the alcohol is driven off. Beat *three ounces* of unblanched sweet almonds into a paste with a little water, and add enough water to make *eight fluid ounces* of emulsion. Mix this in a bottle capable of containing thirty-two fluid ounces, with the liquor previously obtained; and having corked the bottle securely, shake it occasionally for twenty-four hours. Express the mixture, and filter into a bottle containing *thirty-six ounces* of pure granulated sugar. Finally, add water to the dregs, and again express and filter, until the whole of the fluid extract obtained shall measure *forty-eight fluid ounces.* The almonds employed in the process serve to supply the emulsin necessary to produce the requisite reaction between the water and the amygdalin extracted by the alcohol.‖

Resinoid Extract of Wild-Cherry Bark.—This preparation, known under the name of *prunin*, is one of the so-called concentrated preparations now so much employed in America and elsewhere. There is no definite formula for its preparation, but it is no doubt made in a somewhat similar manner to the resinoid

* Wood and Bache's 'United States Dispensatory,' 11th edit. p. 1119.
† 'United States Dispensatory,' 11th edit. p. 1278.
‡ 'American Journal of Pharmacy,' vol. xiv. p. 27.
§ 'American Journal of Pharmacy,' vol. xxviii. p. 108.
‖ 'United States Dispensatory,' 11th edit. p. 628; and Parrish's 'Practical Pharmacy, 2nd edit. p. 213.

extracts already alluded to by us.* Its properties and administration have been already alluded to in this paper.

Tincture of Wild-Cherry Bark.—This is not generally considered a good preparation in America, but as it is frequently prescribed in this country and elsewhere, we subjoin a form:—Take of wild-cherry bark, bruised, *two ounces;* proof spirit, *twenty ounces.* Digest for fourteen days, express, and filter; or the tincture may be better prepared by the process of displacement or percolation.

Several other formulas for a "Wine of Wild-Cherry Bark,"† "Ferrated Extract,"‡ "Tablets,"§ etc., have been also given in different periodicals, etc.; for the mode of preparation of which we refer our readers to the authorities cited. We have given those which are commonly regarded as the best adapted for ordinary use.

Doses.—The dose of the powder is from *thirty grains* to a *drachm*, which may be repeated three or four times a day; that of the infusion, *two fluid ounces*, or more, repeated according to circumstances; that of the syrup, *half a fluid ounce*, to be repeated as above; that of the fluid extract, *a fluid drachm*, which is equivalent to two fluid ounces of the infusion; that of the tincture, from *two drachms* to *half a fluid ounce.* The average dose of *prunin*, according to Dr. Grover Coe,‖ as a tonic, is *two grains;* as a sedative, from *four to eight grains.* The frequency of the repetition must be governed by the judgment of the practitioner. As an expectorant, according to Coe, *one* to *two grains* should be given every two hours.

INTRODUCTION OF CINCHONA INTO INDIA.

The *Blue Books* that appear under the authority of Parliament contain information that is certainly not wanting in copiousness and variety; but true as this is, it is rare indeed to find one of these documents replete with information belonging especially to the domain of pharmacy. Such however is the case in respect to the "Return to an Address of the Honourable the House of Commons, dated 9 March, 1863;—for, '*Copy of Correspondence relating to the Introduction of the Chinchona Plant into India, and to Proceedings connected with its Cultivation, from March* 1852 *to March* 1863;' ordered by the House of Commons to be printed, 20 March 1863."

The result of this order has been the production of a folio volume containing no fewer than 272 pages and 5 maps, prefaced by a very useful table of contents which enables the reader to gain an idea without much trouble of the somewhat heterogeneous documents of which the volume is composed. Referring to this table we find it to commence with a letter under date 27 March 1852 from the Governor-General of India to the Court of Directors of the East India Company, forwarding a recommendation of the Government of Bengal that cinchona plants should be introduced into India. To this succeed a Minute of the Revenue, Judicial and Legislative Committee of the Company, and a letter from Dr. Royle, strongly urging the desirableness of introducing the culture of cinchona into India. Then follow letters relating to the transportation to India in the year 1852 of a few plants of cinchona obtained from European botanic gar-

* See papers by the author, on *Actæa racemosa*, Pharm. Journ. vol. ii. 2nd ser. p. 462; on *Podophyllum peltatum*, vol. iii. p. 461; and on *Sanguinaria canadensis*, vol. iv. p. 267.

† Amer. Journ. Pharm., vol. xxviii. p. 109.

‡ Amer. Journ. Pharm., vol. xxix. p. 28; and Parrish's 'Practical Pharmacy,' 2nd edit. p. 214.

§ 'Lancet,' vol. i. 1862, p. 160.

‖ 'Concentrated Organic Medicines,' p. 391.

dens, the death of which plants is recorded three years later in letters from Drs. Thomson and Falconer. The unsuccessful attempt to employ the services of British Consuls residing at South American ports, and the munificent (!) offer of the Secretary of the East Indian Company to the Secretary of the Board of Control to repay to the extent of £50, expenses to be incurred in obtaining seed of *Cinchona Calisaya*, are duly narrated. Several letters, minutes and reports extending over about three years follow, and then a communication under date 5 April 1859 from Mr. C. R. Markham offering his services to proceed to South America and procure plants and seeds of cinchona for introduction to India. For this task Mr. Markham possessed certain qualifications to which few men could lay claim: he was well acquainted with several of the forests in Peru and on the frontiers of Bolivia containing Cinchona, some of the more useful species of which (although not a botanist) he knew by sight. He had a knowledge of not only Spanish but likewise of Quichua, the language spoken by the Indians; and he was intimate with many of the public men and landowners on the eastern slopes of the Cordillera. Lastly Mr. Markham was impressed with the importance of the object in view, and anxious to throw his whole energy into the enterprise.

Mr. Markham's offer having been accepted, he quitted England and arrived at Guayaquil in the republic of Ecuador on the 19th January 1860. Upon reaching Lima a week later the prospects of success were not cheering, as we may gather from the following lines to Dr. Forbes Watson:—

"I have met several persons connected with the forests on the eastern slopes of the "Cordilleras, such as Don José Maria Costas, Don Modesto Basadre and others; and "they all tell me that good cinchona trees have become exceedingly scarce both in the "forests of Caravaya and Bolivia; that 10 years ago, when Dr. Weddell was out here, "it would have been comparatively easy to make a large collection, but that now it will "be an enterprise of very great difficulty. The natives both in Peru and Bolivia, have "lately become extremely jealous of strangers, and there is almost the certainty of a war "between those two republics in a few months. The obstacles in the way of success are "of no small magnitude; but at the same time every year of delay would most un-"doubtedly greatly increase them."

Mr. Markham proceeded to Islay, a little Peruvian town surrounded by sandy desert, and the sea-port of Arequipa from which city it is distant 90 miles. There the 15 Wardian cases destined for young cinchonas were put together under the superintendence of Mr. Weir, a gardener who accompanied Mr. Markham. Another 15 cases were reserved for plants to be collected by Mr. Spruce, an excellent botanist residing in South America whose services were fortunately secured for collecting the Red Bark tree in the neighbourhood of Guayaquil.

From Islay, a ride of two days brought Mr. Markham to Arequipa, whence his progress is thus detailed in a letter to the Under Secretary of State for India.

". . . . On March 22nd 1860, I left Arequipa accompanied by John Weir the gardener and arrived at the city of Puno, on the banks of Lake Titicaca, on the 27th, a very painful journey over snowy heights, 15,500 feet above the level of the sea, in the worst season of the year, the rigours of which were increased by the debility brought on by an illness from which I had suffered at Arequipa, and by the *sorochi*, or violent headaches and sickness, occasioned by the great elevation of this region above the sea. The loftiest part of the road is several hundred feet above Mont Blanc."

"At Puno, I was occupied for some days in collecting information which induced me to alter the plans for executing this service, that I had previously formed at Arequipa. I found that a war with Bolivia was imminent; that the state of that country, owing to the excessive rains, would render travelling exceedingly slow; and that the extreme jealousy of the Government and people in preserving their present monopoly of the bark trade, would render it impossible for me to make a collection personally. I have a most

complete distrust of all native agency; I therefore abandoned my intention of going into Bolivia, and it was very fortunate that I did so, for a decree has since been issued by Dr. Linares, the President of that Republic, prohibiting all communication between Peru and Bolivia, and the passage of either travellers or goods across the frontier,—this being, of course, the forerunner of war between the two countries.

"There is no question that the Calisaya tree, the most valuable species of cinchona, is found in greatest abundance in Bolivia; but though scarcer and more difficult to collect, it is also to be met with in the Peruvian province of Caravaya. I finally resolved to proceed without delay to the cinchona forests of Caravaya to make as large a collection as possible myself, without employing any native agent.

"On the 7th April I left Puno and commenced my journey to Caravaya, travelling without a muleteer, and with the cheapest beasts, hired from one village to another, a way which entailed much trouble and annoyance, but which I adopted as being far more economical. There were four broad and very rapid rivers to cross on *balsas*, or long bundles of reeds stitched together, while the mules swam. The plains and mountain ranges over which the way passed, averaged a height of 12,000 to 13,000 feet above the level of the sea, and one snowy pass attained a height of nearly 17,000 feet. The road passed through the towns of Lampa, Pucara, and Azangaro, to Crucero, the capital of the province of Caravaya, which I reached on the 16th April, a distance of 160 miles from Puno. Crucero is a mere collection of mud huts, built on a very elevated swampy plain, just on the western side of the snowy Caravaya range, whence roads branch off over the passes to the forest-covered valleys on the eastern slopes.

"The Peruvian province of Caravaya, in the department of Puno, consists of a snowy range of mountains, extending for 180 miles from the department of Cuzco to the frontier of Bolivia, from the eastern slopes of which long spurs run out to the north and east, until they gradually subside into the vast forest-covered plains which extend for thousands of miles to the shores of the Atlantic. These spurs or ridges enclose valleys, the sides of which are generally covered with dense forest, while the summits of the ridges are clothed with rich pasture-land, interspersed with small thickets in the ravines and gullies. These higher regions are called *pajonales*. The numerous streams and rivers which flow down the valleys of Caravaya, and which have long been famous for their gold washings, finally unite in the plains to form the Ynambari, a tributary of the still unknown Purus, which is probably the largest secondary river in the world.

"The most important of the Caravaya valleys, and that which I determined to examine first, is that of Sandia, which contains a population of 7000 Indians, and annually yields 90,000 lbs. of cocoa, and 10,000 lbs. of most excellent coffee.

"On April 18th I left Crucero, and crossing a lofty snow-covered ridge, commenced the descent from an arctic to a tropical climate, down the beautiful ravine of Sandia. The pass above Crucero is 13,600, and the village of Sandia 6,667 feet above the sea, being a descent of 6,933 feet in 30 miles. Arriving at Sandia on the 20th, I began at once to collect provisions and make other necessary preparation for a further advance into the interior, intending first to examine the *pajonales* of the Sandia valley in search of the β *Josephiana* variety of the Calisaya plant, which Dr. Weddell had informed me was to be met with in these localities, and then to cross a mountain ridge into the forests of Tambopata, where the tree Calisaya and other valuable species of *Cinchona* were said to abound."

It was in this neighbourhood in the midst of the most enchanting scenery and brilliant vegetation, that Mr. Markham first fell in with the cinchona in a state of nature. What a delightful moment! Here was *Cinchona Calisaya*, the most valuable species yet discovered, growing by the road-side,—a number of young plants,—while older shrubs with their exquisite roseate flowers and rich green leaves with crimson veins, appeared lower down the slope. Dr. Weddell, it will be remembered, distinguishes two varieties of this species, the one a tall tree, which he calls *α. vera*, the other a shrub, which he names *β. Josephiana*. These varieties grow in the same region, the β. variety being chiefly found on the high and grassy *pajonales*. Mr. Markham having attentively examined both these plants expresses the decided opinion (in which we entirely concur) that they present no characters of sufficient importance to cause them to be ranked even

as botanical varieties. "I have traced these calisayas," says Mr. Markham, "from the shrub to the tree, without finding any difference in the flower or fruit to warrant even a variety. While still in the region of the *pajonales*, I found four or five trees, 20 to 30 feet high, with flowers and fruits of Weddell's *C. Calisaya* var. *a. vera*."

The tree named by Dr. Weddell *Cinchona boliviana* is now considered by that botanist to be hardly more than a variety of *C. Calisaya*, an opinion concurred in by Mr. Markham, who terms it var. *Morada*, from the bark-collectors' designation *Calisaya morada*. Respecting another variety, *Cinchona Calisaya* var. *Verde*, we find the following:

"The bark-collectors and other natives assured me that there are three kinds of calisaya, namely the *Calisaya amarilla* or *fina* (var. *a. vera* of Weddell), the *Calisaya morada* (*C. boliviana* Wedd.), and the *Calisaya verde* or *alba* or *blanca*, not mentioned as far as I am aware, by any author. They say that the latter is a very large tree, generally growing very far down the valleys and in much lower situations than the other varieties. The veins of the leaves are never purple, but always a pale green,—hence the name. The guide Martinez had cut a tree of this variety yielding six or seven cwts. of bark, including *canuto*, or bark from the branches; and Gironda had seen a tree in the province of Munecas, in Bolivia, which yielded 10 cwts. of *tabla* or trunk bark alone. The true *Calisaya* of Weddell only yields three or four cwts. I was very anxious to obtain plants of a variety which is said to attain so large a growth, and fortunately met with two, which happened to be growing on the heights of Tambopata."

Passing over Mr. Markham's observations on *Cinchona ovata* and *C. micrantha*, two valuable species of which a few specimens were obtained with great labour and difficulty, we find that by the 10th of May, the collection of plants was sufficiently large to fill the fifteen Wardian cases laying at the port of Islay and that it consisted of the following:

Cinchona Calisaya *var. α vera* of Weddell	237
——— ——— *morada* (*C. boliviana* Wedd.)	183
——— ——— *var. β Josephiana* Wedd.	75
——— ——— *verde*	2
——— ovata *var. α vulgaris* Wedd.	9
——— ——— — *β rufinervis* Wedd.	16
——— micrantha (*C. affinis* Wedd.)	7
	529

No ordinary difficulties had to be encountered in the transportation of this precious collection, the chief of which arose from the obstacles thrown in the way by the petty local authorities, who with some reason, foresaw in such attempt, the commencing downfall of a monopoly which had been to their country a source of profit for generations. Another difficulty scarcely less serious, was that of preserving the plants from being frozen to death during a rapid journey over the uninhabited plains of the Cordillera, 15,000 feet above the sea-level. Here is Mr. Markham's description of a part of the route:

"On the 17th of May I left Sandia with one Indian and two mules carrying the plants, and halted under a splendid range of frowning black cliffs near the summit of the snowy Caravaya range. On the 28th I reached the summit of the range, and commenced the journey over vast grass-covered plains covered with stiff white-frost; after being 11 hours in the saddle, I stopped at an abandoned shepherd's hut built of loose stones. The plants, well-covered with the tent and blankets, were placed by my side during the night, with the thermometer between us, which at 6 A.M. was at 20° F., the days and nights bitterly cold, but very fine and generally cloudless. On the 19th I was ten hours in the saddle, and passed the night again in an abandoned hut with the plants beside me, where the minimum of the thermometer was 30°. Two more journeys of similar length, when the minimum during the night of the 21st was 21°, and of the 22nd, 16°, brought me to

Vilque, where I procured an arriero and mules to convey me to Arequipa. The sufferings during my six days' journey over the lofty plains from Sandia to Vilque were very great; the cold was intense, the work I had with the vicious, unmanageable mules was a constant source of anxiety, and I had no food whatever beyond a little parched maize; each day I was upwards of ten hours in the saddle.

"Leaving Vilque on the 24th, by forced and rapid marches over an uninhabited and frozen tract of country, exposed to furious gales of intensely cold wind, I reached the city of Arequipa on the 27th, having travelled over 350 miles of difficult country in ten days, having to accommodate myself to the pace of a walking Indian, and pass much of the time in chasing the vicious mules.

"At Arequipa I found the moss which enveloped the plants still damp; but I watered them once or twice during my stay there between the 28th and 30th, during which time the range of the thermometer day and night was between 56° and 60°. On the 31st, I left Arequipa and, crossing the desert, the plants were safely deposited beside the Wardian cases at Islay on 1st of June."

(To be continued.)

MYNSICHT'S ELIXIR OF VITRIOL.

"Nobilius et efficacius stomachicum in totâ republicâ medicâ nondum inventum esse, experientiam ipsam attestor."—Hadrian à Mynsicht, *Thesaurus et Armamentarium medico-chymicum.*

The statement of Mr. Johnson in the last number of the Pharmaceutical Journal* that the *Elixir of Vitriol of Mynsicht* is identical with the *Acidum sulphuricum aromaticum* of the Edinburgh and Dublin Pharmacopœias, is not quite correct, though it is true that the latter medicine is a simplified form of Mynsicht's preparation which it is doubtless intended to represent. In the London Pharmacopœia of 1721, the following is the formula for

Elixir Vitrioli Mynsichti

℞ Cinnamomi,
Zinziberis,
Caryophyllorum, ana ʒiij.
Calami Aromatici ℥j.
Galangæ minoris ℥iss.
Foliorum Salviæ,
Menthæ crispæ, ana ℥ss.
Cubebarum,
Nucis Moschatæ, ana ʒij.
Ligni Aloës,
Corticis Citri, ana ʒj.
Fiat pulvis. Adde
Sacchari Candi ℥iij.
Spiritûs Vini lb.iss.
Olei Vitrioli lb.j.
Extrahe tincturam digerendo dies viginti s.a. deinde filtra ad usum.

In the succeeding Pharmacopœia, that of 1746, this preparation is replaced by the following:

Elixir Vitrioli acidum

℞ Tincturæ aromaticæ M. lb.j,
Spiritûs vitrioli fortis, olei dicti, P. ℥iv.
Misce gradatim, et postquam fæces subsederint per chartam cola.

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* Page 70.

In the Pharmacopœia of 1788, Elixir of Vitriol is omitted, the College ordering in its place, *Acidum vitriolicum dilutum*, which under the modernized name of *Acidum sulphuricum dilutum*, has been continued in all subsequent editions.

As the mixing of sulphuric acid with alcohol gives rise to the formation of sulphovinic acid, it is obvious that these elixirs may differ in chemical composition from *Dilute Sulphuric Acid.* D. H.

(The following letter on the same subject has been received from Mr. Harvey :—)

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—As applications are continually made to me for the formula of Mynsicht's Acid Elixir since I have prescribed it, and as I find but few are acquainted with it, I beg permission for the insertion of these few lines in your Journal, to inform those of your readers who are not familiar with the name of the acid, that it is a Prussian preparation, and to be read in the Pharmacopœia of that nation. I have taken some pains to examine the article at many of the dispensing establishments in London, and as I find great variety, both as to taste and colour, I am led to believe the aloes wood has been omitted, as in the Edinburgh form. This I consider explains the fact; but which I think so important that it should be noticed. However, my object is to give this mode of publicity in your columns that it may prevent delay on the part of the dispenser, and less suspicion on that of the patient waiting so long for the prescription.

Most obediently yours,

2, *Soho Square.* W. HARVEY.

ON THE DEPOSIT IN INFUSUM CINCHONÆ SPISSATUM.

Feeling assured that everything which tends to throw any light upon, or may be a possible improvement in the practice of pharmacy, will always be kindly received by the readers of the 'Pharmaceutical Journal,' I beg to submit the following remarks upon the deposit formed in the Infusum Cinchonæ Spissatum of the London Pharmacopœia :—

Having several times observed a dense crystalline deposit in the bottles in which the Infusum Cinchonæ Spissatum has been kept, and which was formed by repeated depositions from successive quantities of the preparation obtained from wholesale houses, I was induced to examine it. On removing the deposit from the bottle, to which it adhered so firmly that the glass was fractured in the attempt, and washing with a little distilled water to free it from some adhering mother-liquor and colouring matter, the deposit was found to be tasteless, nearly colourless, quite soluble in water with the aid of a gentle heat; the solution being also colourless. On testing it, I found it to contain a large quantity of lime, and believe the salt to be kinate of lime. The question now arises, whence comes the lime? Certainly not from the bark; for some of the preparation made at home with the distilled water after being poured off from the deposit formed on standing twenty days, as ordered by the College, gave no appreciable deposit after standing six months longer. There appears to be only one other source, and that is the water. Is it possible that common water was used, instead of distilled water, in preparing those samples in which the deposits took place? In such concentrated preparation as this, the purity of the water employed is of the highest importance, for the lime salts which all ordinary water contains are mostly of difficult solubility, and the presence of such impurity is a source of loss to those who do not prepare the Infusum Cinchonæ themselves, as well as very materially affecting the character of the preparation.

At the present time it seems to be fashionable to make pharmaceutical preparations as condensed as possible; but it must be remembered that in these *multum in parvo* preparations accidental impurities are concentrated as well as remedial principles, and we too often find that preparations of this class form but very imperfect substitutes for those they are intended to represent, to the disappointment both of the prescriber and the patient.

ALBINUS JOHN ROBERTS.

18, *Conduit Street, W.*, 13*th August*, 1863.

TYNDALL ON HEAT AS A MODE OF MOTION.

ABSTRACT OF THE THEORY.

BY MR. JOSEPH INCE.

During the season of 1862, Professor Tyndall delivered a course of twelve lectures on Heat, at the Royal Institution: the theory propounded, and the manner in which it was illustrated, have subsequently excited considerable attention. In the hope of placing some of the main bearings of the subject in a concise and intelligible form, the following abstract has been attempted. It will be felt that what is termed a Review would scarcely escape censure as an impertinence even by those who have confidence in that most superficial and unsatisfactory style of literature. In the present sketch, there is not one thought, although presented in a different dress, that is not directly taken from the lecturer's own work.

Lord Bacon, like every other great man, was far in advance of the age in which he lived; it seems also that he was in advance of ours, for thus he speaks in the twentieth aphorism of the second book of the 'Novum Organum:'—"When I say of motion, that is the genus of which heat is a species, I would be understood to mean, not that heat generates motion or that motion generates heat (though both are true in certain cases), but that heat itself, its essence and quiddity, is motion and nothing else; limited, however, by the specific differences which I will presently subjoin, as soon as I have added a few cautions for the sake of avoiding ambiguity. Nor again, must the communication of heat, or its transitive nature, by means of which a body becomes hot when a hot body is applied to it, be confounded with the form of heat. For heat is one thing, and heating is another. Heat is produced by the motion of attrition without any preceding heat. Heat is an expansive motion, whereby a body strives to dilate and stretch itself to a larger sphere or dimension than it had previously occupied. This difference is most observable in flame, where the smoke or thick vapour manifestly dilates and expands into flame. It is shown also in all boiling liquid, which manifestly swells, rises, and bubbles, and carries on the process of self-expansion, till it turns into a body far more extended and dilated than the liquid itself, namely, into vapour, smoke, or air.

"The third specific difference is this, that heat is a motion of expansion, not uniformly of the whole body together, but in the smaller parts of it; and at the same time checked, repelled, and beaten back, so that the body acquires a motion alternative, perpetually quivering, striving and struggling, and irritated by repercussion, whence springs the fury of fire and heat. Again, it is shown in this, that when the air is expanded in a calender glass, without impediment or repulsion, that is to say uniformly and equably, there is no perceptible heat. Also when wind escapes from confinement, although it bursts forth with the greatest violence, there is no very great heat perceptible; because the motion is of the whole, without a motion alternating in the particles.

"Now from this our first vintage it follows, that the form or true definition of heat (heat, that is, in relation to the universe, not simply in relation to man) is in a few words as follows:—Heat is a motion, expansive, restrained, and acting in its strife upon the smaller particles of bodies. But the expansion is thus modified; while it expands all ways, it has at the same time an inclination upwards. And the struggle in the particles is modified also; it is not sluggish, but hurried and with violence."

Not without reason, therefore, do we bow with reverence before the wisdom of the ancients. "To the scientific public" (writes Tyndall) "the names of the builders of this new philosophy are already familiar. As experimental contributors, Rumford, Davy, Faraday, and Joule stand prominently forward. As theoretic writers (placing them alphabetically) we have Clausius, Helmholtz, Kirchhoff, Mayer, Rankine, Thomson; and in the memoirs of these eminent men the student who desires it must seek a deeper acquaintance with the subject. MM. Regnault and Séguin also stand in honourable relationship to the Dynamical theory of heat, and M. Verdet has recently published two lectures on it, marked by the learning for which he is conspicuous. To the English reader it is superfluous to mention the well-known and highly-prized work of Mr. Grove."

Passing by all preliminary dissertations, let us hasten to the vital question at issue. Heat can be, and is (for the fact is patent to the most casual observer) generated by mechanical action. Why should heat be generated by mechanical action, and what is the real nature of the agent thus generated?

Two theories have been offered as an answer:—

1. The Material theory, in which heat is supposed to be a kind of matter, a subtle fluid stored up in the inter-atomic spaces of bodies: thus Gmelin speaks of heat combining with bodies as one ponderable substance does with another; and many other eminent chemists treat the subject from the same point of view. All substances possess in a greater or less degree an apparent power of storing up heat,—lead, for instance, in which heat is generated by compression. Adopting the material theory, the explanation is as follows:—the uncompressed lead was imagined to have a higher capacity for heat than the compressed substance; the size of its atomic storehouse is diminished by compression, and hence, when the lead is squeezed, a portion of that heat which, previous to compression, was hidden, must make its appearance, for the compressed substance can no longer hold it all. Thus the idea of *new* heat being generated was rejected, the quantity of heat in the universe being considered as constant as that of ordinary matter, and thus the utmost we can do by mechanical and chemical means, is to store up this heat, or to drive it from its lurking-places into open light of day.

2. The Dynamical or the Mechanical theory of heat, in which heat is not believed to be matter, but an accident or condition of matter; namely, A MOTION OF ITS ULTIMATE PARTICLES, which is almost the verbal definition of Locke, who said, "Heat is a very brisk agitation of the insensible parts of the object, which produce in us that sensation from whence we denominate the object hot: so what in our sensation is *heat*, in the object is nothing but *motion*."

Sir H. Davy (Works, vol. ii. p. 11) recounts a remarkable experiment. Ice is solid water, and the solid has only one-half the capacity for heat that liquid water possesses. A quantity of heat which would raise a pound of ice ten degrees in temperature, would raise a pound of water only five degrees. Further, to simply liquefy a mass of ice, an enormous amount of heat is necessary, this heat being so utterly absorbed or rendered latent as to make no impression upon the thermometer: *liquid water* therefore at its freezing temperature, possesses a vastly greater amount of heat than *ice* at the same temperature. Davy reasoned thus:—"If I, by friction, liquefy ice, I produce a substance which contains a far greater absolute amount of heat than the ice; and in this case, it cannot with

any show of reason be affirmed that I merely render sensible the heat hidden in the ice, for that quantity is only a small fraction of the heat contained in the water." He made the experiment, and liquefied the ice by pure friction; and the result has been regarded as the first which proved the immateriality of heat.

When a hammer strikes a bell, the motion of the hammer is arrested, but its force is not destroyed; it has thrown the bell into vibrations, which affect the auditory nerve as sound. A hammer descending on a leaden bullet has its descending motion arrested at a given point; the motion is not destroyed, but is transferred to the atoms of the lead, and announces itself to the proper nerves as heat. This then is the theory attempted to be worked out, that heat is a kind of molecular motion; and that by friction, percussion, and compression, this motion may be generated, as well as by combustion.

But what is the relation of the heat developed by mechanical action to the force which produces it? The man who first raised the idea of the equivalence between heat and mechanical energy to philosophic clearness in his own mind was a physician. Dr. Mayer, of Heilbronn, in Germany, enunciated the exact relation which subsists between heat and work, giving the number which is now known as the "mechanical equivalent of heat," and following up the statement of its principle by its fearless application. All honour is due to one who, without external stimulus, while pursuing his profession as town physician in Heilbronn, raised the conception of the interaction of natural forces to clearness in his own mind. In 1842 Mayer had calculated the mechanical equivalent of heat from data which only an original thinker could have turned to account; it was from the velocity of sound in air that Mayer determined the mechanical equivalent of heat. In 1845 he published his memoir on "Organic Motion." It was the accident of bleeding a feverish patient at Java, in 1840, that led him to speculate on these subjects. He noticed that the venous blood in the tropics was of a much brighter red than in colder latitudes, and his reasoning on this fact was the origin of his investigations. In 1848 appeared his essay on "Celestial Dynamics." Nevertheless, however honourable it may be to Mayer to have elaborated in his own mind this grand idea, it is to Mr. Joule, of Manchester, that we are mainly indebted for the *experimental* treatment of the subject. Entirely independent of Mayer, he persisted for years in his attempts to prove the invariability of the relation which subsists between heat and ordinary mechanical force; he made numerous experiments; he caused disks of cast iron to rub against each other, and measured the heat produced by their friction, and the force expended in overcoming it.

He urged water through capillary tubes, and determined the amount of heat generated by the friction of the liquid against the sides of the tubes; the result being that under all circumstances, the quantity of heat generated by the same amount of force is fixed and invariable; that is to say, that however the temperature may differ in consequence of the different capacity for heat of the substance employed, the *absolute amount of heat* generated by the same expenditure of power, is in all cases the same. In this way it was found that the quantity of heat which would raise one pound of water one degree of Fahrenheit in temperature, is exactly equal to what would be generated if a pound weight, after having fallen through a height of 772 feet, had its moving force destroyed by collision with the earth. Conversely, the amount of heat necessary to raise a pound of water one degree in temperature would, if all applied mechanically, be competent to raise a pound weight 772 feet high, or it would raise 772 lbs. one foot high. The term "foot-pound" has been introduced to express the lifting of one pound to the height of a foot. Thus the quantity of heat necessary to raise the temperature of a pound of water one degree being taken as a standard, 772 foot-pounds constitute what is called the Mechanical Equivalent of Heat.

Suppose a ball of lead falls from a height of twenty-six feet, the heat generated is proportional to the height through which the body falls. Lead falling through 772 feet would generate heat sufficient to raise its own temperature 30°, its "capacity" being one-thirtieth of that of water: hence, in falling through twenty-six feet (*i. e.* about one-thirtieth of 772), the heat generated would, if all concentrated in the lead, raise its temperature one degree.

But if motion be imparted to a body by other means than gravity, the destruction of this motion also produces heat. A bullet striking a target is intensely heated; the mechanical equivalent of heat enables us to calculate the amount of heat generated by the bullet, its velocity being known. The greater the height from which a body falls, the greater the striking force, owing to the greater acquired velocity; but the velocity imparted to the body is not proportional to the height from which it falls; the height augments in the same proportion as the square of the velocity. On the other hand, the heat generated by the collision of the falling body increases simply as the height; consequently, the heat generated *increases as the square of the velocity.*

It is manifest from these considerations that if we know the velocity and weight of any projectile, we can calculate the amount of heat developed by the destruction of its moving force. Knowing, for example, the weight of the earth, and the velocity with which it moves through space, a simple calculation would enable us to determine the exact amount of heat which would be developed, supposing the earth to be stopped in its orbit. Mayer and Helmholtz have made this calculation, and found that the quantity of heat generated by the shock would be quite sufficient, not only to fuse the entire earth, but to reduce it in great part to vapour. Thus, by the simple stoppage of the earth in its orbit, "the elements" might be caused "to melt with fervent heat." Our earth moves in its orbit with a velocity of 68,040 miles an hour; stop this motion but an instant, and heat would then be generated sufficient to raise the temperature of a globe of lead of equal size 384,000 degrees Centigrade.

Adopting this theory, it has been supposed by Mayer (1848), Waterston, and Professor William Thomson (1853), that the sun itself derived its heat from the showering down of meteoric matter upon its surface; and whatever be the value of this speculation, this pouring down of meteoric matter would be competent to produce its heat and light.

Leaving the sun, let us see whether in this way may not be explained some of the most familiar phenomena of combustion. Place a diamond (held fast in a loop of platinum wire) in an ordinary flame; heat it to redness and then plunge it in a jar of oxygen gas; see how it brightens and glows, and burns like a terrestrial star. Why does it brighten, and glow, and burn? The diamond is pure carbon, and on the surface of this carbon are showered the atoms of oxygen on every side; and could we measure the velocity of the atoms when they clash, and could we find their number and weight, multiplying the weight of each atom by the square of its velocity, and adding all together, we should get a number representing the exact amount of heat developed by the union of the oxygen and carbon: by whatever force urged, whether by chemical affinity, or pure attraction, otherwise called gravity, it matters not, the action is the same. Every oxygen atom as it strikes the surface, and has its motion of translation destroyed by its collision with the carbon, *assumes the motion* which we call heat; and this heat is so intense, the attractions exerted at these molecular distances are so mighty, that the crystal is kept white-hot, and the compound, formed by the union of its atoms with those of oxygen, flies away as carbonic acid gas.

But let us leave the diamond as we have before left the sun, and endeavour in the same way to explain the action of an ordinary flame. What is it? Take a jet of gas. Within the flame we have a core of unburnt gas, outside we have the oxygen of the air. The external surface of the core is in contact with the

air, and here the atoms clash together, and by their collision produce both light and heat.

But the exact constitution of the flame, as revealed by Davy, is worthy of our attention. Coal-gas is a hydrocarbon, that is, a chemical union of hydrogen and carbon. When the combustion is incomplete the soot and lamp-black escape; here, as in the burning diamond, we have this compound gas in the presence of the oxygen of the air; we apply heat, and the gas bursts into flame. The oxygen first closes with the hydrogen and sets the carbon free; the solid particles of carbon thus scattered in the midst of burning matter are raised to a state of intense incandescence, and becoming white-hot, it is to them mainly the *light* of our lamps is due. The carbon eventually closes with the oxygen and becomes carbonic acid. To the existence then of solid carbon particles is due the light; and therefore by passing a current of air through such a flame, sufficient oxygen would be introduced to combine with the excess of carbon, and a considerable diminution of light would be the result.

To return to the theory; it is to the clashing together of the oxygen of the air and the constituents of our gas and candles that the light and heat of our flame is due: it is the impact of the atoms of oxygen against the atoms of sulphur which produces the flame observed when sulphur is burnt in oxygen; to the collision of the same atoms against the phosphorus are due the heat and dazzling light which result from the combustion of phosphorus in oxygen gas: in short, all cases of combustion are to be ascribed to the collision of atoms which have been urged together by their mutual attractions. That the arrest of mechanical motion results in heat may be illustrated in innumerable ways; a weight falls to the earth, and in so doing is found to be heated; a cannon ball is fired against a target, the result being the same. The mode of motion changes, but it still continues motion; the motion of the mass is converted into a motion of the atoms of the mass; and these small motions, communicated to the nerves, produce the sensation which we call heat.

Heat then is developed by the clashing of sensible masses and atoms; work is expended in giving motion to these atoms, and heat produced. But we can reverse the process, and by the expenditure of heat execute work. One pound of coal produces by its combination with oxygen an amount of heat which, if mechanically applied, would suffice to raise a weight of 100 lbs. to a height of twenty miles above the earth's surface. Conversely, 100 lbs. falling from a height of twenty miles and striking against the earth, would generate an amount of heat equal to that developed by the combustion of a pound of coal.

Let us turn our thoughts for a moment from the earth to the sun. The whole heat emitted by the sun in a minute would be competent to boil 12,000 millions of cubic miles of ice-cold water. Whence is the sun's heat derived, and by what means is it maintained? Now, upon any theory of the assumption that the sun is merely a burning body, its light and heat must eventually and speedily come to an end; in fact it would burn out. We have seen already heat generated by collision, that is, by an arrest and change of motion. The maximum velocity with which a body can strike the earth is about seven miles in a second; the maximum velocity with which it can strike the sun is 390 miles in a second. And as heat developed by the collision is proportional to the square of the velocity destroyed, an asteroid falling into the sun with the above velocity, would generate about 10,000 times the quantity of heat generated by the combustion of an asteroid of coal of the same weight.

Indeed the existence of the sun's heat has been thus explained, and by this, "the Meteoric theory," it is assumed that meteorites raining down upon the surface of the sun form a perpetual store of heat and light; moreover though this necessarily implies an increase in the actual magnitude of the sun, such augmentation would scarcely be appreciable during the lapse of ages.

Whether this theory be correct or not, there is nothing more wonderful than the influence of the sun's heat. By the act of vaporization the sun lifts mechanically all the moisture of our air, it condenses and falls as rain, or freezes and is deposited as snow. Once more the sun liberates the solidified liquid, and permits it to roll by gravity to the sea. No streamlet glides to a lower level that has not been previously lifted by the sun. More than this, and if possible more wonderful (if any natural phenomenon can be considered as more wonderful than another), is the sun's influence upon vegetable life. Trees and vegetables grow upon the earth, and when burned they give rise to heat, and hence to mechanical energy. Whence is this power derived? In the building of plants, carbonic acid is the material from which the carbon of the plant is derived; the solar beam the agent of separation, setting the oxygen free, and allowing the carbon to aggregate in woody fibre. Without the sun the reduction of the carbonic acid cannot be effected, and an amount of sunlight is consumed exactly equivalent to the molecular work done. But we must not stop at vegetable life, which is the source of all animal life. The sun separates the carbon from its oxygen, and the animal consumes the vegetable thus formed, and in its arteries a reunion of the severed elements takes place and produces animal heat. The warmth of our bodies, and every mechanical energy we exert, trace their lineage directly to the sun. Not therefore in a poetical, but in a purely mechanical sense, are we children of the sun.

So far Professor Tyndall; and it is hoped enough has been strung together to give an idea of the theory propounded, and to awaken an interest in the lectures themselves. It would lead us too far for our present purpose to enter upon the details of the subject; and yet I may say, braving the charge of affectation, that no romance contains more exciting passages than these strictures upon heat. The laws of expansion, the liquid and gaseous states of matter, the physical properties of ice, the phenomena of latent heat, of potential and dynamic energy; leading onwards to the consideration of larger physical phenomena, such as wind and rain, the Gulf-stream, snow and glaciers, find their fitting place in these discussions. With radiant heat we have already been made acquainted, while for those who like practical applications there is "a discourse upon the Mer de Glace," containing the well-known notice on Professor Forbes.

Two episodes have resulted from these lectures, the first of which ran hard upon a quarrel. Mr. Joule took exception to the manner in which Mayer's claims to notice had been stated; accordingly he wrote a letter to the editors of the 'Philosophical Magazine' upon the matter; part of it is as follows:—

"Gentlemen,—Will you permit me to trouble your readers with a few remarks on the subject of my friend Professor Tyndall's lecture at the Royal Institution, reported in your last number? In this lecture he enforces the claims M. Mayer, a philosopher whose merit has perhaps been overlooked by some of our English physicists, and unaccountably so by his fellow-countrymen. I myself was only imperfectly acquainted with his papers, when, in good conscience and with the materials at command, I gave a sketch of the Dynamical theory of Heat, in my paper published in the Philosophical Transactions for 1850. M. Mayer's merit consists in having announced, apparently without knowledge of what had been done before, the true theory of heat. This is no small merit, and I am the last person who would wish to detract from it. But to give to Mayer, or indeed to any single individual, the undivided praise of propounding the dynamical theory of heat, is manifestly unjust to the numerous contributors to that great step in physical science." (Here follow quotations from Locke, Rumford, Davy, and Séguin.) "From the above extracts, it will be seen that a great advance had been made before Mayer wrote his paper in 1842. Mayer discourses to the same effect as Séguin, but at greater length, with greater perspi-

cuity, and with more copiousness of illustration. He adopts the same hypothesis as the latter philosopher, viz. that the heat evolved on compressing an elastic fluid is exactly the equivalent of the compressing force, and thus arrives at the same equivalent, viz. 365 kilogrammes per 1° Centigrade. It must be remarked that at the time Séguin and Mayer wrote, there were no known facts to warrant the hypothesis they adopted. There was no reason to assert that the heat evolved by compressing a gas was even approximately the equivalent of the compressing force. This being the case, may account for the inattention of the scientific world to these writings. The dynamical theory of heat certainly was not established by Séguin and Mayer. To do this required experiment; and I therefore fearlessly assert my right to the position which has been generally accorded to me by my fellow-physicists as having been the first to give a decisive proof of the correctness of this theory." Mr. Joule concludes by stating that he lays claim to no monopoly of merit, as others have materially assisted to develope the dynamical theory, nor does he wish in the slightest degree to detract from the personal ability and the intrinsic value of Mayer's original researches. Whereon Tyndall, on his return from Switzerland, wrote the reply that now forms the last appendix in his book. He begins with saying that he had in his lectures made full acknowledgement of the claims of Mr. Joule, and continues thus:—"It was not my object, in the lecture to which you refer, to give a history of the mechanical theory of heat, but simply to place a man of genius, to whom the fates had been singularly unkind, in a position in some measure worthy of him. I was quite aware of all that you have stated regarding Locke, Rumford, Davy, and others; you might have added Bacon to your list. Probably no great generalization was ever established without having first simmered in the minds of many thinkers. But the writings of Mayer form an epoch in the history of this subject; and I certainly should not feel disposed to retract a single sentence that I have written in his favour; I believe he deserves more praise than I have given him. It was he who first used the term 'equivalent' in the precise sense in which you have applied it; he calculated the mechanical equivalent of heat from data which, as I have said, 'a man of rare ingenuity alone could turn to account;' and his calculation is in striking accordance with your own experimental determinations. You worked independently of Mayer, and in a totally different way. You brought the mechanical theory to the test of experiment, and in this way proved its truth." He goes on to state that Mayer made his deductions from known existing data, and that the best proof of his actual claim would be the republication of his memoirs in a translated form.

The second episode is the review contained in the 'Athenæum,' April 25, 1863, which indeed was the first incentive towards an attempt to produce something more definite and reliable. The writer has hinted his praise and blame in such mild and uncertain phraseology as to leave no doubt that his sole acquaintance with the subject was the little he had skimmed at hap-hazard from the book. But short as is the notice, it contains a sentence the lecturer has thought fit to answer.

"The mountain, upon whose 'heaven-kissing' summit is seated the angel of truth, is not to be assailed in the spirit which has given so much celebrity to our author, amidst the snow-clad mountains of Switzerland. The impetuous zeal by which the summit of Mont Blanc was achieved will not avail in climbing into the higher, the sublimer regions of truth!" and he then quotes the one rhetorical paragraph in the book, describing the power and the action of the sun. Writers as well as speakers have often the very excusable vanity of ending with a little glory; it seems hard that a man may not be allowed to wind up twelve laborious lectures with a flourish, especially when the flourish is only a poetical word-rendering of the more sober truth; it seems harder still that such should be given as the specimen of his style. Here is the reply:—

"HEAT AS A MODE OF MOTION.

"I trust you will permit me to make a few remarks in connection with the brief review of my lectures on heat which appeared in your last number. It is quite possible that my mode of treating the subject may be open to even graver criticism than that which your reviewer has bestowed upon it, but I should be extremely sorry if an alleged personal defect on my part should stand between the readers of the 'Athenæum' and a generalization which they ought to be among the earliest to understand and appreciate. The dynamical theory of heat, forming as it does the most important part of the theory of the interaction of natural forces, is deemed by the most competent authorities of this age fit to stand, in point of importance, beside the Newtonian theory of gravitation. It is held without misgiving, by the leading natural philosophers of all the countries of Europe. Had the theory still to be discussed, I should never have presumed to bring it before the public as I have done. But proofs of it of the most varied and conclusive character have been accumulating for the last twenty years, until they have at last disarmed all opposition. This theory must not only be the future guide of the practical engineer in his application of heat as a motive power, but in its more purely intellectual bearings the theory must profoundly affect the whole course of philosophic thought and inquiry. It, moreover, opens up views of vital phenomena, and of the organization of the material universe, which cannot be regarded with indifference by any thinking man; and it is for these reasons that I have endeavoured, as far as in me lay, to divest the subject, without injuring it, of technical difficulties, and thus to render it accessible to the intellectual public of England.

"The passage which your reviewer has done me the honour to quote is the most highly coloured in the book. It reads, indeed, more like romance than science; and nothing is more natural than that it should stagger those who have not closely followed the developments of modern physics. It may be, and probably is, open to the charge of unnecessary iteration, but certainly no coolness or calmness on my part could add to the substantial truth of the statements therein contained. When, for example, I say that 'every fire that burns and every lamp that glows dispenses light and heat which originally belonged to the sun,' I mean to express a *fact*, and not a figure of speech. The heat of every fire in London is as much a part of the sun's heat as if every glowing coal had been taken by a tongs from the body of the sun and put into our grates; and the sun's heat has been diminished by the exact quantity emitted by our fires. This seems very wonderful, but it is only a small part of the wonders which the dynamical theory of heat lays open to our view. The lifting of a weight from the earth is a commonplace act; but it is an act of the same mechanical quality as that performed by the sun when he lifts the oxygen from the carbon of carbonic acid gas, and permits the latter to store itself in the boles, branches and leaves of our trees. It is the solar force thus invested in the vegetable, that afterwards becomes the source of all animal power. Muscular force is simply the sun's force transmuted. The helmsman stands at the wheel, but he cannot add one jot or tittle to the motion of the ship. He directs, but cannot create. Equally ineffectual is human volition, or the organic processes of the animal body, to generate one unit of mechanical force. All such force is primarily derived from the sun. These are the latest verities of science, and, read in their light, the passage quoted by your reviewer will not appear extravagant. I may add, that these considerations are confined to the twelfth lecture of the course, and that the work embraces the relationship of the dynamical theory to all the phenomena of heat. It is, moreover, so written that the reader who wishes it may also make himself acquainted with the old theory. Indeed, the old theory comes out with greater vividness by its contrast with the new one.

"JOHN TYNDALL.

"*Royal Institution, April* 27, 1863."

Enough upon the theory; let me end with quoting the last passage in the lectures. I think the most fastidious reader will not pass censure on the style. "To nature nothing can be added; from nature nothing can be taken away; the sum of her energies is constant, and the utmost man can do in the pursuit of physical truth, or in the applications of physical knowledge, is to shift the constituents of the never-varying total, and out of them to form another. The law of conservation rigidly excludes both creation and annihilation. Waves

may change to ripples, and ripples to waves, magnitude may be substituted for number, and number for magnitude, asteroids may aggregate to suns, suns resolve themselves into floræ and faunæ, and floræ and faunæ melt in air,—the flux of power is eternally the same.

"It rolls in music through the ages, and terrestrial energy, the manifestations of life, as well as the display of phenomena, are but the modulations of its rhythm."

26, *St. George's Place, Hyde Park Corner.*

REPORT OF THE RESULTS OF PHYSICAL AND CHEMICAL INVESTIGATIONS, AND OF THE APPLICATIONS OF PHYSICS AND CHEMISTRY IN THE ARTS.

The Detection of Arsenic in Copper.—Dr. Odling gives in the 'Journal of the Chemical Society' the following simple and efficient means for recognising minute traces of arsenic in the metallic copper intended to be used in Reinsch's test. He conceives that as even in the most satisfactory performance of this test there is always some, although but an extremely small quantity of the copper dissolved, and as commercial copper is rarely quite free from arsenic, and sometimes contains a very notable proportion thereof, it is important that the copper to be used in medico-legal researches should be specially tested as to its purity.

But as in the ordinary mode of experimenting by Reinsch's process the amount of metal dissolved is scarcely appreciable, it is quite unnecessary to submit any considerable quantity of it to examination. If a solution of four or five grains of the copper does not yield any evidence of arsenic, it is quite pure enough for the purpose, even though a little arsenic should be recognised in the solution of a larger quantity.

As a means of detecting traces of arsenic in copper, the author believes that the following process is superior to any hitherto proposed in conjoint delicacy and rapidity of operation:—

A few grains of the copper, cut into fine pieces, are placed in a small tube-retort with an excess of hydrochloric acid and so much ferric hydrate or chloride as contains a quantity of iron about double the weight of the copper to be acted upon. The mixture is then distilled to dryness, some care being taken at the last to prevent spurting. The whole of the copper is in this way quickly dissolved, and any arsenic originally contained in it carried over in the form of chloride of arsenic, which may be condensed in a little water with the excess of aqueous hydrochloric acid. The resulting distillate is then tested for the presence of arsenic, by treating it with sulphuretted hydrogen, or, preferably, by boiling in it a fresh piece of clean copper foil or gauze. In some cases, the residue left in the retort may be treated with a little fresh hydrochloric acid, again distilled to dryness, and the distillate collected and tested along with that first produced.

Most oxygenants other than ferric chloride are objectionable, as by their reaction with hydrochloric acid they give rise to free chlorine, which passes over with the distillate, and renders it unfit for being immediately tested either with sulphuretted hydrogen or fresh copper. Cupric oxide or chloride, on the other hand, is scarcely active enough for the purpose; while the dissolution of copper in hydrochloric acid brought about by mere exposure to the air is extremely tedious.

It may be as well to add that ferric chloride is rendered quite free from arsenic by evaporating it once or twice to dryness with excess of hydrochloric acid.

Separation of Magnesia from Potash and Soda.—The means which have been hitherto adopted for effecting the separation of magnesia from the alkalies have been long and tedious. The only perfect precipitant for magnesia, that is to say phosphoric acid, could not be employed for the purpose without involving a very troublesome method for the subsequent elimination of the excess of phosphoric acid.

M. A. Reynoso has recently communicated to the French Academy a very elegant method of accomplishing this object, founded upon a reaction which he himself discovered

some time since. We will suppose a case which very frequently occurs, as in the analysis of waters for instance :—A liquid containing a mixture of lime, magnesia, and the alkalies to be separated. Solution of sal-ammoniac, excess of ammonia, and oxalate of ammonia are added to precipitate the lime, which is then filtered off. To the filtrate is added phosphate of ammonia or solution of tribasic phosphoric acid (keeping excess of ammonia in the solution), by which the phosphate of magnesia and ammonia is precipitated. This is separated with the usual precautions, and the clear liquid evaporated to dryness, and the residue heated to drive off ammoniacal salt. Usually also the excess of phosphoric acid will expel all the hydrochloric acid at the same time. To be perfectly safe, however, the residue is treated two or three times with nitric acid and calcined, by which the whole of the hydrochloric acid is removed, and there remains nothing but phosphoric acid, potash, and soda. This residue is then treated in a flask with a large excess of granulated tin and with nitric acid. In the reaction which occurs, the stannic acid formed combines with the whole of the phosphoric acid, forming a compound perfectly insoluble in water and in nitric acid. The mass is diluted and filtered; the filtrate containing only the nitrates of the alkalies may be evaporated to dryness and calcined to form carbonates, or treated with hydrochloric or sulphuric acid to form chlorides or sulphates which can be weighed. The relative quantities of potash and soda may then be determined either by the indirect means, or directly by chloride of platinum.

The only source of error in working this process is the presence of hydrochloric acid in the residue when treated with tin and nitric acid: this is readily avoided in the manner described.

The Action of Iodine on Ammonia.—The explosive body produced by the action of aqueous ammonia upon iodine, sometimes called "*iodide of nitrogen*," has been investigated by several distinguished chemists with the view of determining its composition and constitution. It has resulted that several different formulæ have been given; and it has become evident that by modifying the conditions under which the iodine and ammonia are brought together, the composition, and to some extent the properties, of the resulting compound may be changed.

Thus Bineau assigned to the product the formula NHI_2, regarding it as an ammonia in which two equivalents of hydrogen were replaced by two equivalents of iodine.

$$N\begin{cases}H\\I\\I\end{cases}$$

Bunsen, by the action of ammonia upon an alcoholic solution of iodine, obtained a body to which he gave the formula

$$NH_3NI_3.$$

This compound may be viewed as an ammonia in which one atom of hydrogen has been replaced by an ammonium having 3 of iodine in the place of 3 of hydrogen; thus:—

$$N\begin{cases}H\\H\\(NHI_3).\end{cases}$$

Dr. Gladstone, however, obtained by the same means a body having the composition assigned by Bineau to his compound. By the action of dry ammonia upon iodine, a body is obtained to which Millon gives the formula NH_3I, and to which Bineau assigns the composition

$$3(NH_3)I_2.$$

It will be seen that all the compounds yet obtained contain hydrogen, and are obviously substitution-products of ammonia. The name "iodide of nitrogen" is therefore inaccurate, and can no longer be properly used to designate these bodies.

Dr. F. Guthrie, the Professor of Chemistry in the Royal College of Mauritius, has recently discovered a new compound of this class, and one which in several respects is very remarkable.

This new body has the composition

$$NH_3I_2$$

and must be regarded as the iodide of an ammonium in which one of the hydrogen atoms is replaced by an iodine atom. Thus:—

$$N\left\{\begin{matrix}H\\H\\H\\I\end{matrix}\right\}I.$$

It is therefore named by Dr. Guthrie the *Iodide of Iodammonium.*

This body is readily formed in the following manner:—A saturated solution of some very soluble salt of ammonia (the nitrate or carbonate) is treated with about one-third of an equivalent of hydrate of potash, so that all the potash is neutralized and the ammoniacal salt is in excess. To the clear solution finely powdered iodine is added in small quantities, with constant agitation. The iodine appears to be immediately and perfectly liquefied; no appreciable heat is evolved. The resulting compound presents itself as a *thoroughly mobile brownish-black liquid.* The supernatant saline solution remains almost colourless. A few bubbles of gas rise from the lower liquid and drag portions of it to the surface of the upper one. The iodine is used in deficiency to ensure its complete conversion. The iodide of iodammonium is separated by a pipette from the saline solution. Its properties are briefly as follow:—

Exposed in a dry state to the air, it decomposes spontaneously into ammonia and iodine, no other gas being evolved. On agitating it in a eudiometer tube with mercury, iodide of mercury is formed, and the mercury is depressed by the liberated ammonia, which latter is completely absorbed by water.

$$NH_3I_2+2Hg=NH_3+HgI.$$

Treated with water, it is decomposed, colours the water reddish-brown, evolves a permanent gas, and gives rise to a residue which explodes spontaneously under the water. A few grammes of the iodide of iodammonium in a capsule being placed under water in a basin and covered with an inverted test-tube of water, a gas collects in the tube, which, after washing to remove ammonia, is found to be pure nitrogen.

$$2NH_3I_2+HO=NHI_2+NH_4I+HI+HO$$
$$=N+2HI+I+NH_4I+HO.$$

The coloration of the water is due to the solution of the iodine in the hydriodic acid and iodide of ammonium. The formation of the biniodammonia (iodide of nitrogen) is more rapid than its decomposition, so that some of it is left after the original compound is completely broken up.

The caustic alkalies effect the same decomposition as water, but act more energetically on account of the greater affinity of their metals for the iodine.

Acids determine the formation of ammonia.

$$NH_3I_2+HCl=NH_4Cl+I_2.$$

This change furnishes the means of analysis.

The iodide of iodammonium dissolves in ether, bisulphide of carbon, alcohol, and solution of iodide of potassium. On being heated, it is partly decomposed into iodine and an iodiferous liquid, which may be distilled without change, and is probably NH_3I or $3NH_3,I_2$.

Methods for Testing the Purity of Alcohols and Ethers.—It is well known that compound ethers are always liable to contain small quantities of water and of alcohol, even when they have been carefully rectified and dried. Alcohols also frequently contain traces of compound ethers. These impurities are difficult to separate and often not easily detected. M. Berthelot gives the following elegant and efficient means for their recognition:—

"1. I take as a starting-point the fact that a compound ether, if pure, is decomposable by an alkali, by saturating an equivalent weight of this alkali. By this means, as I showed about ten years ago, the analysis of ethers and analogous compounds is founded on an alkalimetric test, based on the use of a standard solution of baryta.

"2. By means of the same liquid the smallest quantities of compound ethers may be recognized and estimated in alcohol or in simple ethers, provided these bodies are not alterable by alkalies. Ten cubic centimetres of a standard solution of baryta, and a known weight of the body to be tested, are enclosed in a flask. It is then heated for about a hundred hours at 100°; if the alcohol is pure, as is oftenest the case with ordinary alcohol, the standard of the baryta does not change. Amylic alcohol, on the

contrary, almost always contains a small quantity of compound ethers, as also does ordinary ether, even after digestion on milk of lime.

"Glycol prepared by the ordinary methods, and rectified to a certain point, is particularly impure. I have found in it as much as 22 per cent. of combined acetic acid, corresponding to 40 per cent. of monoacetic glycol. This fact may occasion more than one error, and the knowledge of it will be useful to chemists occupied with this curious substance.

"To recognize the presence, without estimating, of a neutral ether in an alcohol, I heat the alcohol with twice its volume of water, for twenty hours, at 150°. Most of the neutral ether changes into acid.

"3. The presence of a free acid in an alcohol or an ether is so easily recognized that I need not stop to describe the process. Formic ethers, for instance, are always acid; but they decompose so promptly as to prevent the exact estimation of the free acid. The free acid of other ethers, on the contrary, can be precisely estimated.

"4. The presence of a small quantity of water in a neutral ether may be detected by heating this ether to 150° during twenty or thirty hours; the water decomposes an almost equivalent quantity of ether into acid and alcohol. The acid is then estimated by a standard solution of baryta. On submitting acetic ether carefully purified by the ordinary methods to this test, it will obstinately retain one per cent. of water, which is with great difficulty eliminated.

"5. The presence of a small quantity of water in alcohol may also be detected by mixing the alcohol with a perfectly anhydrous compound ether, tested as above. It is then heated for twenty or thirty hours at about 150°. If the alcohol is anhydrous, the mixture should not become acid.

"6. The presence of a small quantity of alcohol in a neutral and anhydrous ether, acetic ether for instance, may be detected by heating the ether with a known weight of quite pure acetic acid. The standard of the acid will diminish according to the amount of alcohol."

THE ERROR AND THE REMEDY.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—As a rule, it is much more easy to point out a real or an imaginary error than to suggest the most potent remedy. In the article styled "The Error and the Remedy," which appears in the Journal for this month, the writer has evidently fallen into an error himself, and is not, we think, very happy in the remedy he proposes. The subject to which he draws attention is "the lamentable failure of our Society to accomplish the objects for which it was founded." This would be lamentable indeed if he had "proved" his statement to be fact: mere assertion goes only for what it is worth. If steady progress can be called a failure, the Society has failed indeed. But we submit that the long array of names, consisting of members, associates, and apprentices, published in the July number of the Journal, does not verify the statement of failure.

That our Society "in regard to numbers" does bear but a small proportion to the entire body of chemists and druggists cannot be gainsaid; but, let it be remembered, this is not a fault which should be laid to the charge of the Society, as it belongs more particularly to those who closed the doors against themselves: more than once was the opportunity offered to non-members to enrol themselves as members, but they failed to take advantage of it, and thus the door has been closed. Amongst these there are men of intrinsic worth, who might have been useful members and ornaments to the Society, and it is much to be regretted that they are not amongst us. Yet notwithstanding, this is *not* a *proof* of *failure*. It *was* wished they should be with us: their wish was otherwise; and we must say, that in spite of their absence we have advanced, and hold in our ranks a *very large* proportion of the intelligence of the general body of druggists.

I look upon it, Sir, that the great aim of our Society has been *future*,—to lay

a foundation solid and firm in the present, upon which *future* pharmaceutists may build. We know full well that in all *great reforms* our forefathers sowed the seed, worked hard, and struggled long, so that their posterity might reap the fruit, and glory in the reward which dear-bought experience had won, even though the actual labourers were silent in the tomb. Something akin to this must it be, we submit, ere the business of a chemist and druggist can rise to the rank of profession. There must be an amount of *self-sacrifice* on the part of the progenitor, ere the offspring can realize its future reward.

The writer of the article in question "is not by any means sure that he should consider association with our Society any recommendation to an assistant;" for, says he, "I would much rather take one from a good house of business than from the Pharmaceutical laboratory." Happily *all* are *not* of this opinion, and *if* "the feeling is very general in the trade, especially where anything like a country business is done," we must remind the writer that he is forgetful of one thing,—the laboratory was never intended to make *men* of *business*, and if students have not acquired business habits *prior* to their course of instruction there, they are not likely to be turned out business men from thence; it was not designed to give them *brains*, but to extend their knowledge and deepen their intelligence. There are "black sheep" in almost every flock, but it is not fair to hold up these as representatives of the body.

In every business the *principal* has a duty towards his apprentice, as well as the apprentice having a duty towards himself, and it is here that the *germ* of a business man must be made; and here, again, the fault of incompetence in the *individual* must not be laid to the charge of the Society—he *alone* is responsible, and if he does not make a man of business suitable for "an extensive country business," he may be fitted for a higher calling, and *thus* render himself worthy of the Society to which he belongs; and of this we are certain, the man who is in *possession* of knowledge has greater power and larger resources for usefulness than the one who has *not laboured* to acquire it. We would not hold up examinations as *the* test of general proficiency, but they do represent the fact that the student *has worked* for what he presents himself to attain; and after all, it is not the mere possession of knowledge, but its *application*, which is to be desired, and as *experience* does not depend altogether upon *age*, but upon the use which each makes of ascertained facts, so the value of knowledge depends upon its *practical* application in any way. That young men obtain "nothing but honour from their toil and outlay" is not strictly correct; they may never, probably, have become possessors of their acquired knowledge but for the *stimulus* which prospective examinations afforded them, and thus they have a *decided* gain, which is above that of ordinary honours.

Our right to the title of Pharmaceutist "does indeed depend upon the continuance of our guinea subscription." This is *no* exceptional case: societies can no more do without money than its individual members; and although *present* advantages may be small to its members, its ultimate benefits *will* be greater. The question, "will it pay?" should be forgotten, as money value or money interest belongs not to the Society, but to the individual. We subscribe to the institutions of our land, not for self-aggrandisement, but for the elevation and benefit of our fellow-men; in like manner should it be ours to support our own Society, which has for its object the better education of young men, and their elevation to a higher status by-and-by.

The suggestion of your correspondent in regard to Pharmaceutical Chemists and Masters of Pharmacy, is, we think, untenable; it would lead to a more *odious* distinction than at present exists, and these Masters of Pharmacy would become the very men whom the writer of the article in question would hesitate to receive as assistants, as their very curriculum would unfit them for these "large country businesses;" and as the public do not *now* discriminate between

members and non-members, the difficulty of discrimination would be *then* increased, and without advantage to either. Besides, this would be an unfair "try back;" you would then recognize two grades, members and masters, without considering the rights of *unexamined* Associates and Registered Apprentices; these of course must be examined, and become masters.

Some of us are inclined *still* to stick to our old opinions; we have a great aversion to *too many masters*, for they seldom *all* think and act in harmony together.

We must have an examining body in the event of any future compulsory legislation; we already have one in existence, and *why* should it *not* form *the* nucleus upon which the legislature may base its operation? *Existing* interests would in such a case be *protected* without doubt, and we think it quite well to wait a *little longer*, till matters are more ripe, for still more decided steps.

There are two things which we shall do well to avoid, viz. *internal dissension* and *external strife*. Each one should *fearlessly* state his own opinion upon any subject at issue, and be careful in so doing, that he neither misrepresents the motives of the Society, nor underrates its privileges. Opinions will be criticized and arguments tested; each should be prepared to hear it in a friendly spirit, and not be thwarted by adverse sentiments until the weight of *reason* brings *conviction*.

The idea that we who are members, examined or otherwise, are better qualified and more intelligent than those who are non-members, should not be tolerated, but looked upon as an injustice *to many;* for we *know* that there are amongst *them* men of thorough scientific worth, and good men of business too, whose capabilities are equal, nay, in some cases vastly *superior*, to those who bear the name of Pharmaceutical Chemist.

The time has not yet arrived for strictly *professional* honours, another generation may witness the *hoped-for* result; for the present it is ours to wait, to add to the long list of experience, and bequeath to those who shall follow us as solid and firm a foundation as it is possible for them to build upon; they in their turn will look back upon the ancestral line, and remember that their achievements are due to the steady, self-denying purpose of those who now sleep in the dust

Yours faithfully,
Cheltenham, August, 1863. G. G. HORNSBY.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—On page 52 of the August number of the Journal I learn with much pleasure that the Pharmaceutical Society "has laboured anxiously, earnestly, and not unsuccessfully for upwards of twenty years in promoting the education and welfare of the chemists and druggists of Great Britain." Further on in the same Journal (page 68), I am informed of "the lamentable failure of our Society to accomplish the objects for which it was founded." The writer of the latter paragraph heads his communication "The Error and the Remedy," and offers some hints for improvement, thrown out, as he states, for the purpose of ventilating the subject. There are no doubt many who will reply to these "hints" with greater effect than myself. Nevertheless, as a Major Associate of the Society, I should be glad to have a voice in the matter if you will permit me to say a word or two on the other side.

If any error has been committed, it does not, I think, consist in "trying to obtain a full-fledged, vigorous Society all at once," but rather in placing this Society in a wrong, and therefore an unfavourable light. Overlooking entirely "the objects for which it was founded," we have been too much accustomed to

regard its certificate of membership as a certain passport to success, the *summum bonum* of its entire worth residing in the advice (in imagination inscribed thereon), "Put money in thy purse." This, Sir, is the fallacy we have fallen into, and hence the disappointment which occasionally finds its way into the pages of your Journal. A moment's reflection will suffice to convince the most ordinary observer that success in business does not *depend* upon connection with the Pharmaceutical Society (though I believe it is often enhanced thereby), but rather upon certain individual qualifications which it is out of the power of that Society either to offer or bestow. The Pharmaceutical Society does not guarantee success to its members when granting them their certificates. It does not contemplate turning out a number of "men of business" already cut and dried. It has no power to deal with constitutional tendencies, or to eradicate constitutional defects. It does not profess to dispense good manners and pleasing exteriors *ad libitum*, or to infuse into its members the qualities known as energy, neatness, dispatch, good-judgment, and so forth, and to expect that it should do all or any of these would be simply absurd. What, then, has the Pharmaceutical Society done "after an existence of nearly twenty years," and what will it yet do? Though I am far from believing that the title "Pharmaceutical Chemist" is without its weight in public estimation, yet there cannot, I think, be a doubt that hitherto the benefits conferred thereby have been mainly indirect, and therefore not so distinctly traceable as otherwise they might have been. As time wears on, however, these benefits will undoubtedly become more apparent, and consequently more in accordance with the views of those who look only at the stern practical realities of the counter and the till. In the meanwhile, presuming an error to have been committed, what is the remedy? Plainly the following:—(1) To take a right view of the objects contemplated by the Society. (2) To bring its influence to bear upon individual interests as far as possible, consistently with the position and title of Pharmaceutical Chemist. (3) To bear in mind that success in business (*i. e.* pecuniary success) depends more upon personal fitness for the occupation in a trading point of view, than upon any amount of theoretical knowledge *per se* which study and experiment can possibly secure. With the adoption of these suggestions in the light of a remedy for the supposed error, I think we shall cease to be disappointed with the Pharmaceutical Society. But it may be asked, as it has been asked hundreds of times before, "If the Pharmaceutical Society is so powerless to assist us as men of business, of what use is it?" I am by no means sure, that besides watching our interests generally, the Pharmaceutical Society does not greatly assist us as men of business; the remark made by your correspondent that "non-members are equally successful in business, and non-associates or assistants, as their conforming brethren," being very judiciously qualified by the phrase "so far as my experience goes." But apart from this, I would ask:—Is there no satisfaction, no pleasure, no profit, in understanding the nature of the compounds it is our lot (I was about to say our privilege) to deal with and dispense? Is our occupation so unremunerative that we cannot occasionally rise above the counter and its attendant phenomena? Are we ever to slave on to the cry of hair-oil and Epsom salts, without an effort in the cause of pharmacy, or a thought in the direction of science? Is the story of the cash-box the "be-all and the end-all here"? He must be a most obdurate disciple indeed of the old school who would reduce all alike to pounds, shillings, and pence. But even here the Pharmaceutical Society is something more than a mere "abortion." If it does not openly and freely put money in our purses, as we have been too much accustomed to expect, it offers an equivalent in the opportunities given for theoretical proficiency, and consequently for the application of theoretical knowledge to the requirements of trade; thus, to say the least, placing the candidate in the best possible position to succeed, the inference being, *cæteris paribus*, that under such

favourable circumstances succeed he must. And then there is the philosophy of Lord Bacon, which says that "every man is a debtor to his profession, from the which as men do of course seek to receive countenance and profit, so ought they to endeavour of themselves by way of amends to be a help and ornament thereunto." I am not quite sure that we do not miss the application of this aphorism to ourselves in being content to remain as we are. I am happy to find, however, that a disposition is abroad to meet, discuss, and adopt measures for the further advancement of pharmacy, and the infusion of a cordial and friendly feeling among the members generally. This, I think, may be regarded as one of the fruits of the Pharmaceutical Society, and I sincerely trust it will be attended by such encouraging results as will lead us to see and believe that, after all, there is a bright side to the picture, which, if viewed aright, will replenish our tills, bring contentment to our homes, and lead us joyfully "onwards and upwards through the path of life."

I have only to add that the suggestion of your correspondent to "try back," will probably be best answered by the old Latin proverb, "Vestigia nulla retrorsum."

I am, Sir, yours obediently,

W. WILLMOTT.

27, *Bishopsgate Within, August* 14, 1863.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—May I, though not connected with the Society, be allowed to say a few words in answer to the letter of your Weymouth correspondent headed as above, at which I was much surprised, coming from one who is a member of the Society?

Such correspondence, in my opinion, is apt to mislead and dishearten those young men who are preparing for the examinations, and thus making themselves fit by the proper means for their business. How many would be discouraged by the expression that the Society is much too hard to enter, and that its advantages are not equal to the toil and outlay necessary to obtain them. Not being in any way connected with the Society at present, I cannot quote my own experience regarding the examinations; but from remarks made by those who have passed them, I feel sure they are not very difficult, and that no more is required than is absolutely necessary for those who take upon themselves such a responsible calling; indeed, I have been told by three who have passed the "Major," that they came away surprised that more was not expected from them.

Again, is it only for its pecuniary advantages that young men study to become associates and members of the Society? Have they no higher motive to stimulate their efforts,—no love for knowledge or desire for self-improvement? What is more interesting than the study of nature to one acquainted with the three sciences—chemistry, botany, and geology, all of which may be attained (in most cases) by a little exertion before and after business hours by those who believe in the old proverb, "Where there's a will there's a way"? With regard to the advantages derived from being members of the Society (I allude to members by examination) opinion may differ; but so far as my experience goes, it is just the reverse of that of your correspondent.

A portion of one of the suggestions made by your correspondent, viz. "that an Act be obtained to make membership by examination compulsory," is certainly not a new one, but, so far as I can learn, has been one of the chief objects of the Society from its commencement; the realization, however, seems very doubtful if cold water be thrown upon the best efforts of the Society by its own members. Wishing the Society every success,

I am, Sir, yours faithfully,

ONE PREPARING FOR THE EXAMINATIONS.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—It has been for a long time past my intention to address you upon the same subject as Mr. Barling has done so ably in your last number of the Journal, and I ask permission to occupy some space in your next upon the same privilege, namely, long connection with the Society. I feel now, and have felt for many years, the utter uselessness of paying an annual subscription for the mere purpose of being entitled to the distinction of a Pharmaceutical Chemist, while there are so many around me, not members, who enjoy the confidence of the public not a whit less for their being plain chemists and druggists. It is very nice to have a body of intelligent men banded together for the high purpose of raising the standard of our trade, and it would be more agreeable to me to be able to be in constant communication with such men; but at the same time I cannot see that it is politic to raise the status of the trade to that of a profession. We are to all intents and purposes tradesmen; our daily avocations tend to £. *s. d.* and the greater part of our daily toil is that of any other tradesman, the transfer of our goods for profit. I quite agree with your Correspondent that a good practical knowledge of the drugs we deal in, and of the language prescriptions are written in, is the great matter desired; such knowledge is, or ought to be, sufficient to make a man eligible for membership; and how great is the number of outsiders who would come up to this standard, yet would not be able to pass the scientific examinations now required by the Council! For those who seek for instruction by the attainment of knowledge in the science of our trade, let there be distinctive grades in Chemistry, Botany, etc.; you will then find men who will seek and obtain them, and in so doing will enjoy the laurels they obtain without crushing, as it were, those who now do not belong to us. It does not follow that the best assistants are those who have passed the examinations, for, as a rule, the aptitude for study destroys the qualities of a tradesman. Few professional men are business men (I acknowledge exceptions); but the young man who has passed an apprenticeship in a well-conducted establishment is generally not only a good business man, but has a good and useful knowledge of his trade, and is well fitted to fill the post he occupies; yet the same person may not be well up in mathematics, structural and physiological botany, the wide range of chemistry, and such like sciences. These are the men who would put aside the 'Pharmaceutical Journal' to read the trade hints of the 'Chemist' or the 'Technologist,' and put them to practical use, and though not scientific or learned enough to pass the examinations, they will be nevertheless useful men of their day, and will obtain the confidence of the public equally with the "members by examination." Mr. Barling's suggestions are so good that they need no addition from me; and I am glad to back them up, and am gratified to find that I am not alone in the opinion that "our Society is too hard to enter, and when in, that it gives too small an advantage to its members." I hope others will well consider this matter, and by the force of their arguments, and the co-operation of "outsiders," effect such a reform in the Society that it may become a flourishing, and not a forced, plant.

I am, Sir, yours obediently,

JOHN ASTLEY.

Coventry, August 8, 1863.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—On perusal of this month's 'Pharmaceutical Journal,' I was surprised at the tone of superiority assumed by a writer under the name of "Major Associate," and the supercilious manner in which his provincial brethren are addressed by him.

It appears to be too much the fashion amongst metropolitan druggists (although your correspondent hails from Windermere) to depreciate and sneer at the labours of the provincial trade, because, forsooth, they deal in other things besides those strictly pharmaceutical. But let a "Major Associate" or "any other man" commence an establishment for the practice of "pure pharmacy" in even a respectably-sized provincial town, and I will venture to say that at the end of twelve months a very gloomy prospect awaits him, if, indeed, before that time he be not the identical "X. Y. Z." whose business (?) appears in your advertising columns for disposal. No, Sir, in all cases the trade must adapt itself to the requirements of the district, or be content with failure. I had thought that a "Major Associate" would have had more enlightened views with respect to demand and supply than not to know that in thinly populated districts the requirements of the business are very different to, and that the division of labour and conveniences of life cannot be so carefully studied as in a densely crowded city.

I beg likewise to demur to the proposition which he leaves to be inferred from his remarks, that in what are termed "genteel" neighbourhoods, Associates of the Pharmaceutical Society are always preferred. Such I know in many instances is not the case, and beg on this subject to indorse the very sensible remarks of Mr. Barling in your last.

Again, the instance quoted by your correspondent to illustrate the superiority of the "Pharmaceutical Chemist" over the "Outsider," proves nothing but a piece of gross carelessness by the prescriber and of dogged obstinacy on his part when apprised of his error; indeed, if anything, it rebounds more to the credit of the maligned chemist than otherwise.

Strictures like those before noticed, "while they may make the unskilful laugh, cannot but make the judicious grieve," and tend only to provoke animosity from "those that are without," for every man should be allowed to be the best judge of his own business requirements. Apologizing for the length of this communication,

I remain, Sir, yours very respectfully,

Durham, August 3rd, 1863. A SUBSCRIBER.

JURY LISTS.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Sirs,—The overseers of this parish (Clerkenwell), in the papers they have distributed amongst the several householders for the return of persons qualified to serve on juries for the ensuing year, have omitted to include "Pharmaceutical Chemists" in the list of persons entitled to exemption.

In some parishes these papers are issued every alternate, or every third year, and in some parishes no such papers are issued; it is therefore probable (this being the first year that Pharmaceutical Chemists are included in the "precept") that the returns throughout the country will contain the names of many of our body, and subject them to some trouble and inconvenience in attending personally to claim their exemption when summoned.

My object is, by your permission, to draw the attention of every Pharmaceutical Chemist to the lists which will be affixed to the doors of churches and chapels during the first three Sundays in September; and should his name appear, would suggest that he attend at the petty sessions on the day fixed for hearing objections, having with him the Registrar's certificate of his registration, and get his name erased.

While making these remarks, I may also suggest whether Pharmaceutical

Chemists would not be promoting their own, as well as the interest of pharmacy, were they more generally to adopt the title than they do at present.

I am, Sirs, your obedient servant,
GEORGE PATTISON.

126, *St. John Street Road, August* 21, 1863.

[A case illustrating the importance of the above suggestion is reported in the 'Observer' of August 10, in which a juryman, although claiming exemption, as being 67 years of age, was fined £5 for refusing to be sworn when his name was on the list.—ED.]

PROVINCIAL EXAMINATIONS.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Gentlemen,—From time to time there have been letters inserted in your invaluable Journal respecting the ways and means of increasing the numerical strength of the Society; various as have been the propositions, none of them seem at all practicable or likely to be adopted.

"Provincial examinations" have something plausible about them, but would not, I venture to affirm, be the inducement for young men to present themselves for examination, as your correspondent ("Opifex") supposes; not to consider the inconvenience (rather the impracticability) arising from the inability to procure competent and impartial examiners.

And who, had he prepared for an examination, would not be able to present himself before the London Board of Examiners, where there is every requisite for testing his knowledge in all the branches connected with pharmacy?

Allow me to express an opinion upon this important subject. One of the barriers to admission is the existing examination-fees; obliterate these and you will find a number of young men who are qualified, and numbers more who would qualify themselves, for an examination; and having once entered the Society, would stand by it and pay the annual subscription necessary to its maintenance. The great indifference manifested by members to apprentices and assistants connecting themselves is most baneful to the interests of the Society.

Very few indeed there are who give specified time for scientific studies. This surely ought not to be the case where an apprenticeship is entered upon and a moderate premium paid; it is naturally expected by parents and guardians that the scientific part of the business, theoretical and practical, will be implanted,—at the least, every encouragement given.

I am now speaking of apprentices; of course, assistants could not expect time given to them from the regular hours of business, unless by special agreement, and in many establishments measures of this kind may be arranged.

I would, in conclusion, appeal to members universally that they put forth every inducement to encourage all aspirants, yea, to arouse those who are indifferent, that the interests of the Society be advanced; that young men be qualified for the exigencies of the times; that they be not the scorn of medical men, but meet the want of that profession in their practical manipulations and scientific knowledge.

I submit these few remarks for insertion in your Journal, hoping not to have trespassed upon your invaluable space.

Yours faithfully,
PROGRESS.

Brighton, August 21, 1863.

ON THE PHYSIOLOGICAL PROPERTIES OF NITROBENZOLE AND ANILINE.

BY HENRY LETHEBY, M.B., F.L.S., ETC.

It is on record that Thrasyas, the father of botany, was so skilled in the preparation of drugs, that he knew how to compound a poison which would remain for days in the living body without manifesting its action, and would at last kill by a lingering illness. Theophrastus speaks of this poison, and says its force could be so modified as to occasion death in two, three, or six months, or even at the end of a year or two years. The writings of Plutarch, Tacitus, Quintilian, and Livy are full of instances of what seem to be this kind of slow and occult poisoning. In fact, until recently there has been a common belief among the unlearned that a skilful poisoner could so apportion the dose and combinations of certain subtle agents that he could destroy the life of his victim with certainty, and at the same time measure his allotted moments with the nicest precision, and defy the utmost skill of the physician and the chemist. Even so late as the sixteenth century this belief was shared by the learned of the medical profession; for we are told, in Sprat's 'History of the Royal Society,' that among other questions which were drawn up by the earlier Fellows to be submitted to the Chinese and Indians was, "Whether the Indians can so prepare that stupefying herb, *Datura*, that they make it lie several days, months, years, according as they will have it, in a man's body without doing him any hurt, and at the end kill him without missing half an hour's time?"

Modern toxicologists have long since discarded these notions, and have set them down to the vague fears and exaggerated fancies of the ancients, rather than to the sober contemplation of facts. But the account which I am about to give of the physiological properties of nitrobenzole will show that there is one substance, at least, which realizes to a great extent the extraordinary opinions of the ancients. This compound may be given to-day, and yet, if the dose be not too large, it shall not manifest its action until tomorrow or the day after, and shall then destroy life by a lingering illness, which shall not only defy the skill of the physician, but shall also baffle the researches of the medical jurist. These facts are so remarkable, that they would be hardly credited if they were not susceptible of the proof of demonstration. They are likewise the more interesting and important from the circumstance that nitrobenzole is now a common article of commerce, and is accessible to every one.

In every manufactory where nitrobenzole and aniline are prepared on a large scale, the peculiar narcotic effects of these poisons are often observed. The vapours escaping into the atmosphere are breathed by the workmen, and cause distressing headache and a heavy, sleepy sensation. For the most part these effects are not serious, but are quickly relieved by fresh air and a mild stimulant, as a glass of brandy-and-water. Now and then, however, the workmen, from carelessness in their habits, expose themselves to the action of comparatively large quantities of these poisons, and then the effects are most dangerous. Two fatal cases of poisoning by nitrobenzole have been referred to me by the coroner for investigation during the last two years, and in both instances they were the results of careless manipulation. In one case a man, forty-three years of age, spilt a quantity of the liquid over the front of his clothes, and he went about for several hours in an atmosphere saturated with the poison. In the other a boy, aged seventeen years, received a little of the liquid into his mouth while sucking at a siphon. The effects were nearly the same in both cases, notwithstanding that in one the poison was inhaled, and in the other it was swallowed. For some time there was no feeling of discomfort beyond that of drowsiness; gradually, however, the face became flushed, the expression stupid, and the gait unsteady,—the sufferers had the appearance of persons who had been drinking. Little by little this stupor increased, until it passed into profound coma, and in this condition they died. The progress of each case was much the same as that of slow intoxication, excepting that the mind was perfectly clear until the coming on of the fatal coma. This was sudden, like a fit of apoplexy; and from that moment there was no return of consciousness or of bodily power,—the sufferer lay as if in a deep sleep, and died without a struggle. The duration of each case was nearly the same; about four hours elapsed from the time of taking or inhaling the poison to the setting in of the coma, and the coma lasted for about five hours.

After death there were no appearances of convulsions, but rather of narcotism and

apoplexy. The face was flushed; the lips were livid; the superficial vessels of the body, especially about the throat and arms, were gorged with blood; the dependent parts were turgid; the blood was everywhere black and fluid; the lungs were somewhat congested; the cavities of the heart were full; the liver was of a purple colour, and the gall-bladder distended with bile; the brain and its membranes were turgid, and in the case of the man there was much bloody serosity in the ventricles. Analysis discovered the existence of nitrobenzole in the brain and stomach, and also of aniline.

These effects were so remarkable, that I determined to examine them still further by experiments on domestic animals. Dogs and cats were submitted to the action of from thirty to sixty drops of nitrobenzole which had been well washed with dilute sulphuric acid and water to free it from every trace of aniline. The poison was generally administered by pouring it into the mouths of the animals, but sometimes it was given by means of an œsophagus-tube. When the nitrobenzole had come into contact with the mouth, it always caused discomfort, as if from unpleasant taste, and there was profuse salivation. Its local action on the stomach, however, was never very great, for there was rarely any vomiting until the setting in of nervous symptoms, and this seemed to be due to sympathy rather than to any local irritation of the stomach. Two classes of effects were clearly observed; there was either the rapid coma which characterized the operation of the poison on the human subject, or there was a slow setting in of paralysis and coma, after a long period of inaction.

When the effects were speedily fatal, the animal was soon seized with giddiness and an inability to walk. The weakness of the limbs first appeared in the hind extremities, and was manifested by a difficulty in standing; but very soon it extended to the fore legs, and then to the head and neck. There was complete loss of voluntary power. The animal lay upon its side, with its head drawn a little back, and with its limbs in constant motion, as if in the act of walking or running. The muscles of the back were occasionally fixed in spasm, and every now and then the animal would have a sort of epileptic fit. It would look distressed, would howl as if in pain, and would struggle violently. After this it would seem exhausted, and would lie powerless. The pupils were widely dilated, the action of the heart was tumultuous and irregular, and the breathing was somewhat difficult. For some time, however, the animal retained its consciousness, for it would look up, and wag its tail when spoken to; but suddenly, and often at the close of a fit, it would become comatose,—the eye would remain open, but the conjunctiva would be insensible to touch, and the movements of the limbs would nearly cease; the breathing would be slow and somewhat stertorous, and the animal would appear as if it were in a deep sleep. This condition would last until it died,—the time of death varying from twenty-five minutes to twelve hours after the administration of the poison.

When the action of the poison was slower, there was often no visible effect for hours or days. At first there was always a little discomfort from the taste of the poison, but this soon subsided, and then for a day or more the animal appeared to be in perfect health. It would go about as usual, would be quite lively in its movements, would eat its food heartily, and in fact would seem to be in no way affected by the poison. Suddenly, however, it would look distressed, it would have an attack of vomiting, and it would tumble over in an epileptic fit. When this had subsided, it was generally found that the animal was weak, or even quite paralysed in its hind extremities; and after two or three of such attacks, the loss of voluntary power would extend to the fore limbs. The animal would lie upon its side perfectly helpless, and then the progress of the case was much the same as that already described, except that it was considerably slower. Consciousness, for example, would be retained for days after the animal was paralysed, and, although it was quite unable to stand, it would take food and drink when they were put into its mouth. The condition in which it lay was most distressing: the look was anxious and full of fear; the limbs were in constant motion; and every now and then there would be a violent struggle, as if the animal was in a fit, or was making fruitless efforts to rise. This would last for days, and then there would be either a gradual restoration of voluntary power with complete recovery, or death from exhaustion. The time that elapsed from the administration of the poison to the coming on of the first symptoms, namely, the epileptic fit, varied from nineteen hours to seventy-two, in most cases it was about two days, and the time of death was from four to nine days.

The *post-mortem* appearances were nearly the same in all cases, whether the death

was quick or slow. The vessels of the brain and its membranes were extremely turgid; the cavities of the heart were full of blood; the lungs were but slightly congested; the liver was of a deep purple tint, and the gall-bladder distended with bile; the stomach was natural, without sign of local irritation; and the blood all over the body was black and uncoagulated. Whenever the progress of the case had been quick, and death had taken place within twenty-four hours, the odour of the nitrobenzole was clearly perceptible in the stomach, the brain, and the lungs; and there was always unmistakable evidence of the existence of aniline in the organs of the body. In the slower cases, the odour of the poison had often entirely disappeared; but generally there were distinct traces of aniline in the brain and urine, and sometimes in the stomach and liver; occasionally, however, no poison was found.

It has appeared to me that the facts which are here elucidated are very remarkable; for they not only indicate a rare circumstance in toxicology, namely, that a poison may be retained in the system for many days without showing its effects, but also that the poison may be changed into an entirely different substance. The importance of these facts cannot be overrated; they are alike interesting to the chemist, the physiologist, and the medical jurist; for without dwelling on a very possible occurrence,—namely, the criminal administration of this poison, with the knowledge that the effects would be delayed, that the symptoms would correspond to those of natural disease, that the progress of the case would be lingering, and that there would be either no discovery of poison in the body, or the discovery of a thing different from that administered,—it will be manifest that the study of these facts by the medical jurist is of public importance. To the physiologist they are also interesting, insomuch as they indicate a reducing power in the animal body by the conversion of nitrobenzole into aniline. I have endeavoured to ascertain whether this is due to a living or a dead process. In the first place, I find that dead and decomposing organic matter will effect the change alluded to; for when nitrobenzole is placed in the dead stomach, or is kept in contact with putrid flesh for several hours, there is a partial reduction of it into aniline. This may be the source of the poison found in the dead body; but, on the other hand, there is a great similarity in the physiological effects of nitrobenzole and those of aniline.

When aniline is given to dogs and cats in doses of from twenty to sixty drops, it causes rapid loss of voluntary power. The animal staggers in its gait, looks perplexed, and falls upon its side powerless. Its head is drawn back, the pupils are widely dilated, there are slight twitchings or spasms of the muscles, the breathing is difficult, the action of the heart is tumultuous, and the animal quickly passes into a state of coma. From this it never recovers, but remains upon its side as if in a deep sleep, and so dies in from half an hour to thirty-two hours.

The *post-mortem* appearances are much the same as the last: the brain and its membranes are turgid, the cavities of the heart are nearly full of blood, the lungs are but slightly congested, and the blood all over the body is black and uncoagulated. In every case the poison was easily discovered in the brain, the stomach, and the liver.

While, however, there seems to be a probable conversion of nitrobenzole into aniline in the living animal body by a process of reduction, there is also undoubtedly a change of an opposite character going on upon the surface of the body, whereby the salts of aniline are oxidized and converted into *mauve* or *magenta* purple. Some remarkable facts illustrative of this have been brought under my own notice, and have been the subject of clinical observation.

In the month of June, 1861, a boy aged sixteen was brought into the London Hospital in a semi-comatose condition. He had been scrubbing out the inside of an aniline vat, and while so doing he breathed an atmosphere charged with the vapour of the alkali, and became insensible. He did not suffer pain or discomfort, but was suddenly seized with giddiness and insensibillity. When he was brought to the hospital he looked like a person in the last stage of intoxication: the face and surface of the body were cold, the pulse was slow and almost imperceptible, the action of the heart was feeble, and the breathing was heavy and laborious. After rallying a little, he complained of pain in his head and giddiness. It was then noticed that the face had a purple hue, and that the lips and lining membrane of the mouth and the nails had the same purple tint. The next day, although the narcotic effects of the poison had passed away, he was still remarkably blue, like a patient in the last stage of cholera.

In the early part of last year, sulphate of aniline was given in rather large doses to pa-

tients in the London Hospital affected with chorea. The doses ranged from a quarter of a grain to seven grains. They were frequently administered, so that large quantities of the salt were taken in a very short time. In one case as much as 406 grains were given in the course of a few days. No very remarkable effects followed beyond this, that after a few doses had been taken, and the system had become, as it were, saturated with the salt, the face became of a leaden-blue colour, the lips and gums looked as if the patients had been eating black currants, and the nails also acquired a purple hue. The colour faded a little before the time came for the administration of another dose, but soon after taking it it appeared again; and this was the subject of constant observation. Dr. Fraser and Dr. Davies have recorded the results of their experience in five cases,* from which it would seem that although the free alkali is a powerful poison, the sulphate of it has but little action upon the animal body.

The general conclusions which appear to me to be warranted by these investigations are:—

1st. That nitrobenzole and aniline in its free state are powerful narcotic poisons.

2nd. That they exert but little action, as local irritants, on the stomach and bowels.

3rd. That although the effects may be quick, and the fatal termination of them rapid, yet nitrobenzole may remain in the system for a long time without manifesting its action.

4th. That the salts of aniline are not nearly so poisonous as the free alkali.

5th. That in rapid cases of fatal poisoning, both the poisons are readily discovered in the dead body.

6th. That in slow cases the poisons may be entirely changed or eliminated, and therefore not recognizable.

7th. That both of the poisons appear to be changed in the body by processes of oxidation and reduction, nitrobenzole being changed into aniline, and aniline and its salts into mauve or magenta.

In an appendix† are given notes of the two cases of fatal poisoning by nitrobenzole referred to in the paper, and a detailed account of twelve experiments on animals with nitrobenzole, and three with aniline; also the process employed for the recognition of aniline and nitrobenzole in the dead body, as follows:—

1st. The matters to be analysed were bruised in a mortar with a little water, and very slightly acidulated with dilute sulphuric acid.

2nd. They were then submitted to distillation in a glass retort,—the distilled products being saved in three or four separate portions by changing the receiver at different stages of the process. In this way the presence of nitrobenzole was discovered.

3rd. The residue in the retort, when reduced to a pulpy mass by the distillation, was treated with strong spirit of wine and filtered.

4th. The filtered alcohol solution which contained the aniline was treated with a slight excess of subacetate of lead, and again filtered. In this way gum, dextrine, etc., were removed.

5th. The filtered solution was treated with a slight excess of a saturated solution of sulphate of soda in water. In this manner the excess of lead was precipitated as a sulphate.

6th. The clear solution was then made very alkaline with caustic potash, and distilled to dryness from an oil-bath. The aniline, together with ammonia from the animal matters, was found in the clear, colourless, distilled spirit.

7th. This was neutralized, or rather made acid, with a slight excess of dilute sulphuric acid, and evaporated nearly to dryness in a white porcelain dish. If necessary, the spirit was saved by distillation.

8th. The residue was of a pinkish colour if aniline was present, and occasionally there were little streaks of blue around the edges of the white porcelain dish. If the quantity of the saline residue was not more than a grain or so, it was at once tested by dissolving it in a few drops, or even in a single drop, of dilute sulphuric acid (1 to 1). A small portion of it was then placed upon a strip of bright platinum; and the platinum having been connected with the positive pole of a single cell of a Grove's battery, the liquid was touched with the negative pole: in a few seconds, if aniline was present,

* 'Medical Times and Gazette,' March 8, 1862, p. 339.

† Preserved in the Archives.

the liquid would acquire a bronze, a blue, or a pink colour; the kind of colour being dependent on the amount of aniline present,—bronze being the result of much aniline, and pink of a very little. In this way at least the $\frac{1}{2000}$th part of a grain of aniline was easily recognized.

To another portion of the acid liquid placed upon a white porcelain plate, a little peroxide of lead or red prussiate of potash was added, and a blue or purple reaction followed. This test is not so delicate as the last, for it fails when the amount of aniline is less than the $\frac{1}{1000}$th of a grain.

Other tests may be resorted to if necessary, as when the quantity of aniline is large. Thus peroxide of manganese or bichromate of potash may be used in the same way as the red prussiate of potash in the last experiment; but these tests will not answer with less than the $\frac{1}{500}$th of a grain of aniline. Lastly, a drop of a solution of chloride of lime may be added to the acid liquid, and if the quantity of aniline exceeds the $\frac{1}{100}$th part of a grain it will cause a purple reaction.

9th. If the quantity of saline residue from the last operation is large, and there is reason to believe that much ammonia is present, this alkali must be got rid of, for it greatly interferes with the success of the colour-experiments. The residue, therefore, is made moist with water, and rubbed down with about twice its bulk of neutral carbonate of soda. It is then exposed to the air for a short time until the odour of ammonia has passed away. It is then treated with strong alcohol, filtered, acidulated with dilute sulphuric acid, and again evaporated. The aniline is now fit for the colour-experiments.

There are no fallacies to these experiments; for although, as I have elsewhere shown, strychnia will give nearly the same colour-reactions, yet in the first place this alkali is not volatile like aniline, and will not therefore distil over as the latter does; and in the next place, while the best effects, in respect of colour, are developed with dilute acid and aniline, strychnia requires the concentrated acid. These differences are sufficient to prevent any embarrassment as regards the two alkaloids.

ON THE DISTILLATION OF MIXTURES: A CONTRIBUTION TO THE THEORY OF FRACTIONAL DISTILLATION.

BY J. A. WANKLYN, ESQ.

There are many points in the boiling of mixtures which are obscure. The tension of the vapours at the temperature whereat the mixture boils, and the proportions in which the constituents of the mixture are present, are not the only factors which determine the relative rates at which the constituents distil. There have, for instance, to be taken into account the adhesion of the liquids to one another, and the vapour-densities of these liquids. On the present occasion I have to call attention to the influence of this latter element, which influence seems to have been lost sight of by most of those who have applied themselves to this subject.

Leaving out of account for a moment the influence of adhesion, and simplifying the influence of the proportion in which the ingredients are present by taking equal weights of two liquids of different boiling-points, we may set down the rates at which these ingredients will distil as determined by the tensions of the liquids and the densities of the vapours. In the first instant of time the quantity of each ingredient which distils will be found by multiplying its tension at the boiling-point of the mixture by its vapour-density. It thus appears that the liquid with the highest tension will not of necessity distil the quickest, for what the other liquids want in tension they may make up by the greater density of the vapours which they give off. And so when we mix a more volatile with a less volatile liquid and proceed to distil the mixture, we shall now and then find that the less volatile liquid distils faster than the more volatile one. I will here bring forward an experiment to illustrate this point.

	Vapour-density.
Methyl-alcohol boils at 66° C.	1·107
Iodide of ethyl boils at 72° C.	5·397

I took 18 grammes of methyl-alcohol and 17 grammes of iodide of ethyl, mixed them, and distilled off rather more than one-third of the mixture. The distillate consisted of

6·0 grammes methyl-alcohol,
8·7 grammes iodide of ethyl,

———

14·7

which shows that in this case the less volatile constituent had boiled the faster, the less volatile iodide of ethyl having a very much higher vapour-density than methyl-alcohol.

It will be obvious that when the vapour-densities and tensions are inversely proportional, the mixture must distil over unchanged. This influence of vapour-density goes a great way to explain why homologous bodies are so difficult of separation by means of fractional distillation. The more complex the formula, the higher the boiling-point, but also the higher the vapour-density, and therefore the greater the value of the vapour. Why oils, etc., distil so readily in steam is also explained; for aqueous vapour is one of the lightest, while oily vapours are generally heavy.

VINUM DIURETICUM.

℞ Bacc. Juniperi ....partes 50
Foliorum Digitalis 10
Rad. Scillæ...................................... 5
Vini albi 750

Macera per dies quatuor, deinde adde

Potassæ acetatis ....partes 15

et filtra.

Dose.—Two or three tablespoonfuls daily.—*Trousseau, Bulletin de Thérapeutique.*

SOME ACCOUNT OF *PAULLINIA SORBILIS* AND ITS PRODUCTS.

BY T. C. ARCHER, ESQ.

The author remarked :—There is no more remarkable plant in the Order Sapindaceæ, if regarded from an economic point of view, than *Paullinia sorbilis*, although, as a plant, it is not well known to the botanical world. From its large seeds is manufactured the substance called "Guarana," which is extensively used in Brazil, Guatemala, Costa-Rica, and other parts of South America, as a nervous stimulant and restorative. The seeds deprived of their coverings are pounded into a paste, which, hardened in the sun, constitutes Guarana. It is used both as a remedy for various diseases, and also as a material for making a most refreshing beverage; and it adds another of those incidents so puzzling in human history of the discovery of such qualities in plants least likely to be suspected: such, for instance, as that the leaves of Tea, the seeds of Coffee and Cacao, the leaves and twigs of the various American Ilexes, and other plants, should have this wonderful restorative effect on the nervous system, and that this should not be a mere vague notion, such as attaches to thousands of other plants, but that it should really depend upon the presence of a chemical principle, the same in all, and the operation of which can be satisfactory explained. The presence of an alkaloid, which he called Guaranine, was discovered some years ago in Guarana by Dr. Theodore von Martius, of Erlangen, but its identity with theine was soon established, and subsequent analyses, especially one by Dr. Stenhouse in 1856, proved that not only was the active principle of Guarana identical with Theine, but that, as far as is known, no other substance yields it so abundantly, the amount being 5·07 per cent. as against good black tea, which yields 2·13, and coffee from 0·8 to 1·00. The mode of using the Guarana is curious and interesting. It is carried in the pocket of almost every traveller, and with it the palate bone or a scale of the large fish (*Sudis gigas*), locally called "pirarucú," the rough surfaces of which form a rasp upon which the Guarana is grated, and a few grains of the powder so formed are added to water, and drunk as a substitute for tea. The effect is very agreeable, but as there is a large

portion of tannic acid also present it is not a good thing for weak digestions. Its remarkable restorative power has given it a further great reputation as an aphrodisiac. Another species of this genus, *Paullinia Cupana*, also enters into the composition of a favourite national diet-drink. Its seeds are mingled with cassava and water, and allowed to pass into a state of fermentation, bordering on the putrefactive, in which state it is the favourite drink of the Orinoco Indians.—*Proceedings of the Botanical Society of Edinburgh, in Gardeners' Chronicle.*

MISCELLANEA.

Accidental Poisoning by Laudanum.—An inquest was held August 13th, by Mr. W. W. Driffield, deputy-coroner for the borough of Liverpool, to inquire into the circumstances connected with the death of Mrs. Emily Harriet Brown, wife of Mr. G. M. Brown, banker, residing at No. 10, Prince's Park Terrace, Prince's Park, who died on Saturday morning, August 8th, under the following circumstances:—The deceased was twenty-eight years of age, and was generally a healthy woman. Up to Thursday, August 6th, she had enjoyed good health, although for about a month previously she occasionally complained of languor, which she attributed to change of climate. On Thursday she complained of being bilious, and of having a pain in her back, and said she would prescribe for herself a blue pill and a black draught, as had been prescribed for her two years before, while residing at Leamington. This was before her husband went to town to business, and when he returned home in the evening she was sitting by the drawing-room fire, and complained of being chilly and feverish. On retiring to bed, about eleven o'clock, she told her husband that she had taken a pill; and on Friday morning, about half-past six o'clock, she took the black draught, which was handed to her by the housemaid, Beatrice White. The draught was put into a glass, and on taking it into her hand the deceased said, "How nasty it smells!" and after swallowing it she said she felt "giddy and sick," adding, "Is it possible I have been poisoned?" Her husband laughed off the idea, and soon afterwards left the room. At a little before nine o'clock her husband went into the bedroom, and found that she had been asleep. He did not return till about seven o'clock on Friday night, he having, by previous arrangement, gone to dine at Crosby. While there a message was conveyed to him, intimating that the deceased was very ill. He proceeded home as fast as possible, and on arriving there found her in a state of insensibility, and her breathing intermittent. Three medical men were in attendance. She was in a sinking state, and never rallied, but died about four in the morning of Saturday. From the evidence of George Ross Iliffe, butler to Mr. Brown, it appeared that he was sent on Thursday afternoon by the cook for a blue pill and a black draught, which he obtained at the shop of Mr. Pearson, druggist, Park Road, having stated that it was for a lady. On Friday morning he got a bottle from Beatrice White, which he washed in warm water. It had a peculiar smell, and what remained of its contents had a dark red colour. The same forenoon, between eleven and half-past eleven, the cook and housemaid left home to see the 'Great Eastern,' leaving witness and the deceased alone in the house. He did not see the deceased at any time that day, although he had been several times in the drawing-room. The female servants returned about four o'clock, and White, the housemaid, immediately went to the bedroom, from which she soon returned, saying Mrs. Brown was asleep. The witness then went to Liverpool with his master's clothes, and on returning home about seven o'clock, it was found that the deceased was very ill, and that her countenance was livid. He was immediately sent for a doctor, and after some difficulty got one (Mr. Hamilton), who attended. In the course of Wednesday afternoon this witness was taken to Mr. Pearson's shop, where he was shown two bottles, one of them containing laudanum, the other black draught. The bottle which he got from Beatrice White, and which he washed, smelt like the laudanum, and not like the black draught. In cross-examination, this witness stated that when he went to Mr. Pearson's, the shop was in course of being papered and painted, and was in a confused state. The evidence of Beatrice White was confirmatory of the previous testimony as to giving the deceased the contents of the bottle. Mr. Hamilton, surgeon, was the first medical witness. He had been called between seven and eight o'clock on Friday night to attend the deceased.

He found her livid in the countenance, breathing irregularly, with froth at her mouth, and in a profuse perspiration. He tried to rouse her, but she was perfectly insensible. The pupils of her eyes were contracted and her limbs drawn up, but without any twitching. He turned her, with a view to alleviate the symptoms, and the lividity of the countenance disappeared to a considerable extent. He tried to administer a little brandy and water, but the deceased could not swallow it. He had a consultation with Mr. Stubbs and Mr. Long, who were called in soon after him, and they did not think it advisable to apply the stomach-pump, because her breathing was so irregular, that the introduction of the tube might produce suffocation, and also because so long after taking a narcotic it would be useless.

Dr. J. B. Edwards deposed that he had made an analysis of the contents of the stomach of the deceased, and he had discovered, after purification from animal matter, the presence of meconic acid and of morphia—constituents of opium. The reactions indicated that a large dose of opium had been taken. He had also examined a bottle labelled "black-draught," and now produced. From the odour of the phial he had no hesitation in stating that it had contained laudanum or tincture of opium, but it did not contain sufficient for a chemical analysis. The cork of the bottle was free from the odour of the essential and aromatic oils which are usually present in black-draughts, and from the odour he should be of opinion that the bottle had contained laudanum only.

Mr. Pearson stated that he remembered the witness Iliffe coming to his shop and asking for a black-draught. He conscientiously believed at the time that he was giving a black-draught; but it was possible, owing to the confused state of the shop, that the bottle containing the black-draught might have been removed, and the bottle containing the laudanum put by accident in its place. He deeply regretted if, by an unfortunate accident, he had been the cause of the lady's death.

The Coroner, in summing up, stated that after the evidence of Mr. Hamilton and Dr. Edwards, there could be no doubt that death had been caused by poison, and if the jury believed that Mr. Pearson had negligently supplied a wrong draught, they must find a verdict of manslaughter against him; but if they considered it was an accident, and there was no want of caution on his part, they would then return a verdict that the deceased was accidentally poisoned.

The jury returned the following verdict:—"That the deceased had died from the effects of a deadly poison called opium, carelessly dispensed by Edward Pearson, chemist;" and added, that they considered Mr. Pearson was deserving of censure for not having looked closely to the label on the bottle from which the draught was taken.

Accidental Poisoning by Burnett's Disinfecting Fluid.—On Saturday morning, May 23rd, Mrs. Wood, aged twenty-one, the wife of Captain Thomas Patteson Wood, late of the 29th Regiment of Foot, requested her maid to give her some of Dinneford's Fluid Magnesia, which she had been in the habit of taking. The bottle containing the magnesia stood on a shelf with several other bottles, and the maid unfortunately took one that resembled it, but containing "Burnett's Disinfecting Fluid," some of which she poured out and gave to her mistress. Immediately on swallowing it, Mrs. Wood remarked that she experienced a hot burning sensation such as she had never felt before. This induced the maid to examine the bottle when she discovered the mistake. It was not at first thought seriously of, and some simple antidotes were resorted to. The unpleasant symptoms, however, increased, and two medical men were sent for, by whom the usual remedies were resorted to, but without success; and after suffering great pain and sickness, Mrs. Wood expired about midnight on Sunday. An inquest was held on the following Tuesday, when the jury returned a verdict of "Accidental poisoning," accompanied with a strong expression of disapprobation that a mixture of such a nature should be sold without being distinctly labelled as poison, and the coroner was requested to communicate the presentment to the agents for the sale of "Burnett's Disinfecting Fluid."

This sad case has been quickly followed by another death from the same poison. On Monday morning, June 29th, an inquest was held at the Bricklayers' Arms Inn, Croydon, before Mr. Carter, coroner for East Surrey, and a jury, touching the death of Emily Evans, 17 years of age, the daughter of Mr. J. Evans, who died on Friday, June 26th, from the effects of "Sir William Burnett's Patent Disinfecting Fluid," which was given to her at her own request by her little brother, aged seven years. It appeared from the

evidence of deceased's father that she had been suffering from smallpox, and was attended by Mr. J. J. Johnson, surgeon, Croydon. · About five o'clock on Friday evening last Mr. Evans was attracted to the deceased's bedroom by screams, and on proceeding up stairs found her vomiting. In reply to his question, deceased said, "Oh! father, I have drunk a glass of the stuff from that bottle," pointing to the mantelpiece, where the bottle which contained the disinfecting fluid stood. He said, "How did you come by it?" She answered, "I asked my brother Charles (who was present in the bedroom) to pour me out some, and I took half a glassful." There was no other bottle on the shelf, her own medicine being placed by her bedside on a chair within her reach. From a remark made to her mother by the deceased, it was believed by the father that she knew the fluid was of a poisonous nature. The fluid was bought on the recommendation of Mr. Johnson, as the smallpox had been in the house among the family. The deceased took half a wine-glass of the disinfecting fluid at five o'clock, and died at ten minutes before seven. Mr. Johnson was sent for, but not being at home, did not arrive till after the girl died. The medical testimony went to show that Mr. Johnson found her dead; frothy mucus was coming from the mouth; the legs were drawn up in a cramped position; the hands were natural, but the eyes were dilated. He smelt and tasted the fluid, and found it contained chloride of zinc. He understood the symptoms the deceased laboured under after drinking that fluid, which he knew, from reported cases in Taylor's work, was a corrosive irritant poison. The quantity taken by the deceased had been known to destroy life, and in this case he was of opinion that death resulted from drinking that poison. The coroner having explained the legal points of the case, the jury viewed the body, and afterwards returned a verdict that the deceased's death was the result of accident, at the same time adding they were of opinion that a fluid of so dangerous a nature to human life as Burnett's Patent Disinfecting Fluid ought not to be sold without proper precaution being taken to show that it was poisonous. The coroner said that he wouldwrite to the firm and enclose them a copy of the verdict.

A correspondent of the 'Times,' "G. H. G.," July 29th, in commenting on the evil of allowing an article of so dangerous a nature to be sold without a label of "poison,"* or anything to denote its escharotic properties, upwards of twenty cases of death having resulted from taking this fluid by mistake for medicines, states that in the melancholy case at St. Leonards, he had been informed by an eminent chemist that the lady's life might probably have been saved had carbonate of soda been quickly administered *ad libitum*, as it would have immediately decomposed the chloride of zinc into insoluble carbonate of zinc and common salt. If the composition of the fluid was known to the skilful medical men who attended the case, he is surprised that so simple a remedy was not tried.

Treatment of Poisoning by Corrosive Sublimate.—When a solution of corrosive sublimate is placed upon a bright piece of gold and touched with an iron point, it undergoes decomposition, a thin film of metallic mercury being deposited on the surface of the precious metal. Dr. J. C. Johnston, of Baltimore, by the practical application of this fact, has succeeded in saving the life of a gentleman in that city who had swallowed two scruples of the bichloride of mercury. In less than half an hour afterwards he had given his patient a bolus composed of half a book of gold-leaf, having previously sprinkled a drachm of iron reduced by hydrogen between its leaves. This dose was retained but a short time, when it was repeated with the happiest results; the vomiting and distress ceased; and the man recovered rapidly under the ordinary treatment for gastritis. Dr. Johnston thinks that if the gold-leaf had been rubbed in a mortar with bright iron filings, and the mixture given with water, it would have been more speedily successful than the plan he adopted in his hurry.—*Boston Med. and Surg. Journal, and Chemical News.*

Accidental Poisoning by Morphia.—An inquest has been held before Mr. Bedford, at the Ship tavern, Vauxhall Bridge Road, on the body of Walter Henry Deeley, an infant. The mother had been confined on the 3rd of August, and was attended by Dr. Battie, who had previously prescribed for her a preparation of morphia. It appeared that the nurse, Emma King, had inadvertently taken up the bottle containing the morphia instead of one of similar shape containing dill-water, and had given a

* We learn by a letter from Messrs. Burnett and Co., in reply to the above, that the suggestion respecting a coloured label with the word "Poison" has already been adopted; and that the fluid is now sold in coloured, fluted bottles.

teaspoonful of the drops to the infant. On discovering her mistake, Dr. Battie was sent for, who found the child suffering from the effects of some narcotic. He tried every remedy without avail, and the child died on the following day. He felt certain the child died from the effects of morphia; the quantity of the mixture given would contain the twelfth of a grain of morphia. The morphia was obtained of a very respectable chemist, but was not labelled 'poison.' The coroner thought that all poisons should be labelled as such. Dr. Battie replied that many ladies objected to take medicines which were labelled poison; besides which, many medicines intended for adults would cause the death of children if taken by them, even of six months old. The coroner then suggested that a peculiar cork he had seen, cut like spikes, which would slightly prick the fingers of the person touching it, might be used for bottles containing poison. The jury returned the following verdict, "That the deceased child died from the morphia administered accidentally for dill-water."

"A Dose of Pills."—An inquest was held lately by Dr. Lankester, on a man who had in three days taken sixty-four of "Morrison's pills." A *post-mortem* examination was made by Dr. Ballard, who stated that the deceased had suffered from disease of the heart. The jury returned a verdict of "death from natural causes."

Treatment of Earache.—In numerous cases of earache, the vapour of chloroform has been used with perfect success. Take a common tobacco-pipe, place a wad of cotton in the bowl, then drop eight or ten drops of chloroform upon it, and cover with another wad of cotton; place the stem to the affected ear, then blow into the bowl; the chloroform vapour is carried into the ear, and the pain almost instantly ceases.—*Journal of Materia Medica, and British American Journal.*

Adulteration of German Yeast.—Dr. Letheby has examined several samples of this yeast imported into London from Schiedam, which he found to contain from one-third to half their weight of pipe-clay. Dr. Letheby states, that the presence of the alumina of the pipe-clay might, from its great quantity, lead to the charge against the baker for adultering his bread with alum. At the same meeting of the City Commissioners of Sewers, a letter was read from Mr. Blackburn, a chemist of Durham, confirmatory of the above. Mr. Blackburn had examined some yeast, which he found to contain pipe-clay in the proportion of three drachms of the latter in the ounce of yeast. A large quantity of Dutch yeast of the same brand has since been seized and condemned by the Sanitary Inspector of the Local Board of Health, Hull, which, after examination by Dr. Letheby, was found to be adulterated.

Weights and Measures.—On Tuesday, July 28, Mr. Ewart gave notice that early next session he would move for leave to bring in a Bill for legalizing the use of the metric system of weights and measures; but, in accordance with what he understood to be the general wish of the House, he would merely propose that the Bill should be permissive.

The Wax-Tree of Japan.—"On this remarkable plant, the *Rhus succedanea* of botanists, the 'Bulletin de la Société d'Acclimatation' publishes an interesting paper by M. Eugène Simon, now at Nagasaki. The vegetable wax of Japan is one of the chief articles which that country exports. It is not exactly of the same nature as common wax, since it melts in summer at the common temperature; but this inconvenience is obviated in Japan by protecting the candles made with this wax by a coating of bees-wax. It appears that in England a process has been discovered for increasing its consistency, since the demand for the article from that quarter has considerably increased of late. The tree itself might be easily acclimatized in the southern parts of France. It thrives on mountains and on stony and barren ground, unfit for other agricultural purposes. M. Simon has sent over about twenty kilogrammes of its seed for trial. The young trees are planted in Japan along the highways, when they are two years old, leaving a distance of about three feet between the stems; but if planted in squares, the distance must be double. The trees are kept low by lopping, and trimmed in the shape of pyramids. In the fifth year after planting, each tree yields on an average 4lb. of seeds; in the eighth year, 6lb.; in the 10th, 18lb.; in the 12th, 40lb.; in the 15th, 60lb.; in the 18th year the tree enters upon its decline; 400lb. of seed yield 100lb. of wax. At present 200lb. of this wax are sold in London at the price of £5; so that a plantation of 10,000 trees in their prime may produce £4000. The seed is gathered towards the end of autumn, threshed, and then left to dry for a fortnight, after which it is slightly roasted. It is next crushed under a millstone, and the produce exposed

to the heat of steam in canvas bags; the wax is then obtained by the action of a screw press. This wax is of the third or lowest quality; to bleach it, it is rasped, rinsed in water, and then exposed to the action of the sun and dew for three days. A still higher quality is obtained by repeating this operation."—*Times*.

A Remedy in Diphtheria.—Dr. A. de Grand, in a paper published in the 'Revue Thérapeutique,' recommends ice as a specific in cases of diphtheria. Several cases are given in which the remedy was perfectly successful.

BOOKS RECEIVED.

A DICTIONARY OF CHEMISTRY AND THE ALLIED BRANCHES OF OTHER SCIENCES. Founded on that of the late Dr. Ure. By HENRY WATTS, B.A., F.C.S., etc., assisted by eminent contributors. In Four Volumes. Vol. I. Abichite—Conglomerate. London: Longman, Green, Longman, Roberts, and Green. 1863. 8vo, pp. 1137.

THE MADRAS QUARTERLY JOURNAL OF MEDICAL SCIENCE. Nos. 10 and 12. Madras: Gantz Brothers. London: John W. Davies, 54, Princes Street. Edinburgh: Maclachlan & Co. Dublin: Fannin & Co.

PETROLEUM AND ITS PRODUCTS: an Account of the History, Origin, Composition, Properties, Uses, and Commercial Value, etc., of Petroleum; the Methods employed in refining it; and the Properties, Uses, etc., of its Products. By A. NORMAN TATE, F.C.S., etc. London: John W. Davies, 54, Princes Street. Liverpool: H. Greenwood, 32, Castle Street. Price 2*s*. 6*d*. 1863.

TO CORRESPONDENTS.

A Suburban Chemist is thanked for his letter. The subject had already claimed attention.

Rogatus (Chesterfield).—(1) You must obtain, in addition to the book you named, Fownes's 'Chemistry;' Bentley's 'Manual of Botany;' and the Latin Pharmacopœia. (2) The examinations of the Pharmaceutical Society are conducted, and certificates of qualification given, without reference to the means by which the knowledge required of the candidate may have been obtained.

An Associate (Edinburgh).—The article generally sold under the name of *Liquor Taraxaci*, or *Fluid Extract of Taraxacum*, is that prepared by the addition of spirit to the freshly-expressed juice, although an article made by inspissating the juice is sometimes sold under the same name.

C. W. H. (Manchester).—The certificate of examination is, of course, an imperative condition only in Government situations.

Inquirer.—The Latin Pharmacopœia; Royle's 'Materia Medica;' 'Pharmaceutical Latin Grammar;' Fownes's 'Manual of Chemistry;' and Bentley's 'Manual of Botany.'

J. C. (Richmond).—*Liquor Taraxaci* made by the addition of spirit to the juice expressed from the root.

E. W. (Abersychan).—*Storm Glass*. Vol. ii., page 777.

A Member.—*Show Colours*. Vol. iii., pages 94 and 143.

Dr. W. Bird Herapath is thanked for his communication, which is omitted for want of space.

ERRATUM.—*A Bill for the Prevention of Accidental Poisoning*, page 80, *for* "Mr. Paull, Mr. Sclater-Booth, and Mr. Walter," *read* "Viscount Raynham and Mr. Wykeham Martin."

Instructions from Members and Associates respecting the transmission of the Journal before the 25th of the month, to ELIAS BREMRIDGE, Secretary, 17, Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Mr. CHURCHILL, New Burlington Street. Other communications to the Editors, 17, Bloomsbury Square.

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. V.—No. IV.—OCTOBER 1st, 1863.

KNOWLEDGE A SOURCE OF POWER.—THE MEANS TO THE END.

Man is ever seeking for power, and the desire to attain it is one of the strongest incentives to the acquirement of knowledge; yet it frequently happens that when the means for the attainment of knowledge are provided, comparatively few avail themselves of the opportunity presented to them. It cannot be doubted that knowledge is a source of power. Why, then, do not all who desire the power seek after knowledge as the means to the end? There is perhaps a lingering doubt as to the kind of knowledge best calculated to give the power sought for.

In the discussions which from time to time occur with reference to the qualification of chemists and druggists, it is sometimes represented that a chemist may have too much knowledge of chemistry, and a druggist be too well acquainted with the natural history of drugs; that scientific attainments are of little value to practical men of business, and that all that is required in the chemist and druggist is that practical knowledge which every man can gain behind the druggist's counter. It is obvious that if this position be entirely correct, the Pharmaceutical Society has been founded upon a wrong basis, and those who have been striving to carry out its objects have no just grounds to complain of the lukewarmness, indifference, or even opposition with which they have been met by many from whom they looked for a very different reception.

The position in the form in which we have put it is neither wholly true nor altogether untrue. A chemist and druggist need not be very profound as a chemist or naturalist; there would be no adequate scope for such attainments in his ordinary business occupations, nor sufficient remuneration to compensate for the cost of its acquirement; yet some amount of scientific knowledge is desirable, and an excessive or undesirable amount is not probable as the result of any system of education provided for pharmaceutical students. Should there be those who by dint of great industry and natural abilities attain to an amount of scientific eminence with which their occupations as pharmaceutists may be uncongenial, they would no doubt rise to their proper sphere, like Liebig, Dumas, and others, while the profession in the study and pursuit of which the foundation for their future reputation was laid would reap the honour of having contributed such bright examples of scientific celebrities. But such cases are of very rare occurrence, and the acquirement of too much knowledge need not be feared; yet there is just enough of truth in the position stated to enable men who deal in vague assertions to represent the system of instruction provided and

the scientific qualification required by the Pharmaceutical Society as neither necessary nor beneficial for those engaged in the practice of pharmacy, and young men are thus often deterred from seeking the position they would otherwise desire to occupy as pharmaceutical chemists.

That knowledge gives power, and that power is an object of every man's ambition, will not be denied. The only question that can arise is with reference to the kind of knowledge most suited to give the power required. The chemist and druggist or pharmaceutist wants the power of so conducting his business as to satisfy the requirements and gain the confidence of the public. The power of writing poetry, or of speaking the Chinese language, would not help him to his object, neither would a knowledge of astronomy or navigation. Even with reference to Chemistry, the very high cultivation of it, as a science, may rather detract from than contribute to the power of conducting a business which involves close and constant application to many very commonplace operations of a technical nature. All this is freely admitted, and the importance of a thoroughly practical acquaintance with operations, and the possession of habits and manners, which can only be acquired in the shop, is not doubted. But in addition to this there is something wanted to make an accomplished Pharmaceutist. What that something is it has been one of the objects of the Pharmaceutical Society, and those connected with it, to point out and explain. It is such a knowledge of Chemistry, Botany, and Materia Medica as implies a systematic study of these subjects, and will furnish an adequate knowledge of the natural history, the characters, properties, composition, and mode of production, of every article used in medicine. This knowledge is not calculated to carry the possessor out of his business, or beyond his province as a dealer in drugs and dispenser of medicines. It will not weaken, but on the contrary it will add to his power of conducting his business, and of obtaining an adequate remuneration for the time and labour and capital he has invested. If the knowledge referred to can be acquired by young men without leaving the shop, there is no reason why they should not acquire it in that way. The means of doing so will no doubt be more frequently presented as those who take apprentices become themselves more thoroughly educated. But such means of acquirement cannot be depended upon, nor would they be suited for all capacities. There are many young men who, to gain a competent knowledge of the subjects referred to, must for a time devote themselves exclusively to systematic study. It is to enable such to carry out their intentions that the educational arrangements of the Pharmaceutical Society have been provided. The lectures and practical laboratory instruction given in the Society's house are especially designed to supply the sort of knowledge which a Pharmaceutist ought to possess, and which he has but rarely the means of acquiring in any other way.

A prospectus in which, with much other information relating to the Institution, a full description is given of the means of instruction provided, of the prizes and other inducements to study offered, and of the examinations instituted by the Pharmaceutical Society, has just been prepared, and students will do well to obtain this from the Secretary and carefully to peruse its contents. It will serve to dissipate erroneous notions which may be entertained, and may help the determinations of some who are hesitating as to the course they should pursue.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *September 2nd*, 1863,

Present—Messrs. Bucklee, Hanbury, Meggeson, Morson, Sandford, Standring, and Waugh,—

Mr. Henry Constable Roberts, 254, High Street, Southwark, was elected a Member.

REGULATIONS OF THE BOARD OF EXAMINERS.

The Board of Examiners in London.

The regular days of meeting for conducting the examinations are the third Wednesday in every month throughout the year, excepting August and September, at 11 A.M.

The Board of Examiners in Edinburgh.

The Board meets at such times as suit the amount of business to be transacted. Notice is given in the 'Pharmaceutical Journal' when such meetings are to take place.

Classical or Preliminary Examination.*

Candidates for registration as Apprentices or Students in Pharmacy are examined in the following subjects:—

Latin,—translation of a passage from the first book of Cæsar's Commentaries, 'De Bello Gallico.'
Latin Grammar.
English Grammar and Composition.
The first four rules of arithmetic, simple and compound, vulgar fractions, and decimals.

No candidate shall be admitted to this examination until he has completed his fifteenth year.

Candidates residing at a distance of more than ten miles from London (or if in Scotland, at that distance from Edinburgh), may, on applying to the Secretary, and enclosing the specified fee and certificate of age, be supplied with a printed form of certificate, to enable them to be examined by any qualified person approved by the Board, *but not being the teacher of the candidate.*

The certificate of examination, duly signed by the Examiner, and delivered to the Secretary, will, if approved by the Board, entitle the candidate to be placed on the register.

Minor Examination.

Candidates are examined in the following subjects:—

Prescriptions.—The candidate is required to read without abbreviation autograph prescriptions; to translate them into English; and to render a literal as well as an appropriate translation of the directions for use.

Practical Dispensing.—To weigh, measure, and compound medicines in the most approved manner; to write the directions in concise language as well as in a *neat and distinct* hand, and correctly translate the prescription; finally, to finish and properly direct each package. The candidate will be required to spread plasters with dexterity and neatness.

Pharmacy.—To recognize the several preparations of the Pharmacopœia which are not

* The Middle Class Examination of Oxford, Cambridge, or Durham, and the Examination of the College of Preceptors, including Latin as one of the subjects, are accepted on behalf of Registered Apprentices or Students in Pharmacy, in lieu of the examination by the Board of Examiners in Bloomsbury Square.

of a definite chemical nature, such as extracts, tinctures, the simple and the compound powders, etc.; to describe the composition of such as are compound, and to give the proportions of the active ingredients.

Materia Medica.—To recognize the several specimens of roots, barks, leaves, fruits, resins, gums, etc., contained in the Materia Medica of the Pharmacopœia, to give the botanical names of the plants yielding them, the Natural Orders to which they belong, the countries from which they are obtained, and the officinal preparations into which they enter; also, to recognize and describe the sources of the more important animal substances used in medicine.

Botany.—To recognize the medicinal plants of the Pharmacopœia; and to possess a knowledge of the elementary structure of plants, and of the general characters and structure of root, stem, leaf, flower, and fruit.

Chemistry.—To recognize the several acids, oxides, salts, and other definite chemical bodies ordered in the Pharmacopœia; to describe the processes by which they are produced, the composition of such as are compound, and the decompositions that occur in their production.

No candidate shall be admitted to this examination until he has completed the nineteenth year of his age, and has passed the "Preliminary" Examination or complied with the provision stated below.*

Major Examination.

Prescriptions and Posology.—The candidate is required to render in good Latin, prescriptions written in English, to detect errors in written Latin prescriptions, and to discover the occurrence of unusually large doses when such are prescribed.

Practical Dispensing.—If sufficient dexterity has been manifested in ordinary dispensing operations at the "Minor" Examination, the candidate will not be required to repeat them. He will be examined with reference to his knowledge of the strength of simple solutions ordered in the Pharmacopœia, by which he may be enabled readily to make practical application of such knowledge; also with reference to the best excipients and methods of manipulation, for forming emulsions with oils, resins, balsams, and other substances not otherwise miscible with aqueous liquids, and for giving a good pilular condition to substances which are administered in that form.

Pharmacy.—The candidate is required to explain the processes employed for the preparation of medicines which have not a definite chemical composition, including maceration, percolation, evaporation, etc., and to manifest an acquaintance with published improved processes for pharmaceutical preparations.

Materia Medica.—The examination will extend to the qualities of Drugs, the means of estimating these qualities, and of distinguishing the genuine from the spurious. It will comprise a knowledge of the active proximate constituents of the most important drugs, and of the methods of obtaining these in a separate state and testing their purity.

Botany.—The candidate will be expected to possess a more intimate acquaintance with the subjects referred to in the "Minor" Examination, and also to have a knowledge of the characters by which some of the more important Natural Orders of plants are distinguished.†

Chemistry.—The examination will comprehend, the laws of chemical combination, the means of determining, by tests, the composition of chemical substances used in medicine, and especially of detecting impurities; also the means of detecting poisons, and the best antidotes for poisons, to be administered in cases of emergency. In this part of the examination will also be comprehended chemical physics, as far as this branch of knowledge is treated of in Fownes's 'Manual of Chemistry.'

No candidate shall be admitted to this examination until he has completed the twenty-first year of his age, and has passed the "Minor" Examination at least three months previously, excepting that, with reference to the last-named condition, the Board may depart from the rule under special circumstances which appear to them to justify such a departure.

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* Candidates who have not passed the preliminary examination, may pass it at the same time as the Minor Examination, upon giving previous notice to the Secretary.

† *A Schedule of the Natural Orders and Genera of Plants referred to, may had of the Secretary.*

Candidates, who, in the opinion of the Board of Examiners, have passed such an examination in the "Major" as entitles them to be placed in the first division, will be eligible to compete for the Pereira Medal.

Candidates for the respective examinations must give notice to the Registrar of their intention to present themselves for examination, together with certificates of age and fees, one week prior to the day of examination. Candidates for the Major Examination are required to attend, for the written examination *on Chemistry, Botany, and Materia,* on the day previous to the meeting of the Board. *If a candidate fail to pass either of the examinations, the fee will not be returned to him, but he will be admitted to a subsequent examination without further payment, after not less than three months, on giving the required notice.*

EXAMINATION OR REGISTRATION FEES.

	£	s.	d.
Classical (Registered as an *Apprentice*)	2	2	0
Minor (Registered as an *Assistant*)	3	3	0
Or if not previously registered	5	5	0
Major (Registered as a *Pharmaceutical Chemist*)	5	5	0
Or if not previously registered	10	10	0

PROVINCIAL TRANSACTIONS.

BRITISH PHARMACEUTICAL CONFERENCE.

The Conference, convened by a circular published in the 'Pharmaceutical Journal' for August last, was held at Newcastle-upon-Tyne on Wednesday, September 2, being the last day of the meetings of the British Association for the Advancement of Science.

Accordingly the following gentlemen met at Baker's Hotel at 11 A.M. :—J. Attfield, Ph.D., F.C.S., London; Professor Bentley, F.L.S., London; J. G. Barford, Wellington College; W. H. Brown, North Shields; H. B. Brady, F.L.S., F.C.S., Newcastle; H. Deane, F.L.S., Clapham; A. Greaves, Ironville, Derbyshire; T. B. Groves, F.C.S., Weymouth; S. Gale, F.C.S., London; J. B. Edwards, Ph.D., Liverpool; T. J. Howson, Gateshead; R. J. J. Mays, South Shields; C. L. Metcalfe, Hull; R. Parkinson, Ph.D., Bradford; B. S. Proctor, Newcastle; F. M. Rimmington, Bradford; R. Reynolds, F.C.S., Leeds; F. Sutton, F.C.S., Norwich; W. Symons, F.C.S., London; E. C. C. Stanford, F.C.S., Glasgow; and E. Wood, London.

Mr. Deane was called to the chair, and Mr. Brady was requested to take notes of the proceedings.

Mr. Brady introduced communications from gentlemen who were unable to be present, but who expressed a hearty sympathy with the objects of the Conference and best wishes for its success. Dr. Attfield also reported having received similar expressions of goodwill towards the movement. Altogether, these communications showed that the objects of the Conference were supported by the following gentlemen, in addition to those who signed the circular of August 1, viz. :—Professor Redwood, Messrs. T. H. Hills, D. Hanbury, Wilmott, S. L. Howard (London), Mackay (Edinburgh), Parr (Nottingham), Carr (Berwick), W. Proctor, jun. (Newcastle), Edmonds (Lowestoft), and Tylee(Bath).

A letter was read from Mr. Pooley, of Bath, stating that he and Mr. Tylee had visited Bristol, and after consulting with some of their pharmaceutical brethren in that city, they united in inviting the Conference to meet next year at Bath, at the time of the meeting of the British Association.

Mr. Deane said: The object of our meeting together on this occasion is, as you are aware, to establish an annual Conference, to be held in different parts of the country, for the purpose of affording a periodical opportunity of meeting our brethren in the provinces and discussing various subjects of the highest importance to us in our public and private relations, an object in which I fully concur, and, I trust, if carried out in the spirit in which it has been conceived, it will tend to promote the interest and brotherly unity of all engaged in the work; as well as to still further raise the practice of pharmacy more nearly to the character of a profession in the public estimation than it at present possesses, although much and great good has been done in this direction by the Pharmaceutical Society of Great Britain, whose labours to promote this great object have been incessant for the last twenty years. As we are not a rich body, time is of great value to us, and moreover, personal attention to business is an essential element of success in it; it is therefore almost impossible to centralize our operations in a fixed locality so as to enable many individuals of so extensive and scattered a body to take part in the consideration and discussion of such subjects as will come within the scope and design of our Conference. But it has been thought by some amongst us that if we could have a friendly gathering either at the time of the meeting of the British Association or some other time that might be considered more convenient, a much greater number might be found to take an interest in the science and art of our trade than at present do. Many would look forward to these gatherings with interest, partly for the sake of the gratification of meeting their brethren and exchanging ideas, and partly for the sake of the increase of knowledge they will gain from the papers and reports which it is hoped will be abundantly furnished on each occasion. At the present time the profits resulting from the exercise of our deeply responsible occupation are so small, and the necessity for personal attention at every hour of the day and night so urgent and imperative, that the mind becomes depressed, and a man seems to live for no other earthly object than to keep soul and body together with the scanty pittance his business brings him in; and the energy and talent which might be devoted to improving his mind and elevating his position, is kept in abeyance for want of a motive to exertion. But is it not probable that a wholesome stimulus to intellectual exertion may be given by the prospect of annual gatherings of this kind, and that men in looking forward to them will look around to see whether they too cannot add a little, however small, to the usefulness of the meeting, and that stock of knowledge which is so important to their own welfare and success in life? and each may begin to see more clearly that a man's duty is not confined within the four walls of a shop, but that there is a duty to the class to which he belongs and to the public also; and that as the love of truth and order and precision gain ground amongst them, inferior, adulterated, and spurious drugs will no longer be in demand: and the public and medical profession will perceive that although under the necessity of keeping a shop and wearing an apron, however humble a man's means or income may be, derived from the honourable exercise of his calling, he will not be stigmatized as most of our brethren at present are as a mere shopkeeper, but be looked upon as a veritable and important, though humble member of the medical profession. This work must necessarily be slow, as many of us are well aware from the experience of the last twenty years; but if we can give a stimulus in the right direction and maintain it, our meetings of the Conference will not be in vain.

I believe that one of the greatest difficulties we at present have to contend against is ignorance in our own body, and that ignorance chiefly arising from the deficient and defective education of the youths who are apprenticed to the trade. Their knowledge of arithmetic does not always include the rule of three, for I have met with many who could not state a simple rule of three sum

(fractions were unknown), and who were perfectly incapable of estimating the profit or loss on any article their masters dealt in; and their knowledge of Latin so imperfect that not one word in three was properly pronounced. It is not for us now to enter into the cause of this state of things. I name it to show what we have before us. It is this ignorance we must individually and collectively endeavour to dispel, for I am satisfied that it is the fruitful source of all that is rotten among us, such as intentional adulterations and substitutions, recklessness in dispensing physicians' and other prescriptions, mystifications of formulæ, loading our shelves with useless lumber, quack medicines, underselling, and indifference to one's neighbours' welfare, and a host of other well-known evils, which mostly vanish in proportion as an honest love of truth, order, and precision take the place of a culpable and unworthy ignorance.

The formation of this Conference is a novel experiment, essentially provincial, and I believe it is calculated to engage the interest of men in every position, and prove to them there is no reason why they should not take an active part in their own intellectual elevation. To show the direction in which many country chemists may endeavour to advance our stock of scientific knowledge, I may mention the fact that our medicinal herbs, such as Conium, Hyoscyamus, Digitalis, Colchicum, etc., are believed to vary considerably in their properties when grown under different circumstances of soil, light, heat, moisture, and natural or artificial cultivation. As every plant is known to require certain inorganic elements for its healthy growth and existence, it is obvious that unless the proper conditions are complied with it is highly improbable these plants will possess or attain their full medicinal virtues; hence, especially under cultivation, we may be supplied with herbs very far below that standard which we ought to seek after. Having determined these conditions, we may be led on to the discovery of the correct principles on which we may successfully work out the problem of the artificial production of the alkaloids; for I believe their production in the living plants is in some way connected with the inorganic elements of the plants in which they are found.

I must not trespass longer on your time on this occasion, as there is much to be done in the way of settling the constitution and rules for our guidance.

Mr. Deane concluded by calling upon Professor Bentley to move the first resolution.

Professor BENTLEY expressed the pleasure he felt in being called upon by the Chairman to propose the first resolution, which was to the effect that an Association be formed for the purpose of holding an annual meeting in the provinces, of those interested in the practice and advancement of pharmacy. He was quite sure that most pharmaceutists would agree with him as to the advantages which would accrue from the establishment of such a society; indeed, the presence of influential representatives at this meeting from many of the large towns and districts of the country, was in itself evidence of the interest taken in the movement. One great advantage which would arise from such a Conference would be the promotion of a friendly reunion and social intercourse amongst the members of the Pharmaceutical profession,—the first thing to be aimed at in all associations. While referring to these annual conferences, he felt called upon to express his warmest thanks (in which he was sure all present would cordially agree) to the inhabitants of Newcastle and the neighbourhood for their kindness and for the unbounded hospitality which they had exhibited to the members of the British Association at the present meeting. This was the first meeting he had attended, but he trusted sincerely that it would not be the last.

Another advantage which must arise from such an association, if its objects were carried out judiciously and in an energetic manner, would be the advancement of pharmaceutical science; indeed, this ought to be their great desire.

He believed that this would be best promoted by committees undertaking to report at their next meeting upon subjects of great interest to pharmaceutists generally. Such committees, he thought, should not be too large, but should comprise working and competent observers from different parts of Great Britain. It should be the province of the members of such committees to collect together any local information they could, and to investigate the subject with reference more especially to the districts in which they were severally placed; and then their conjoined results should be worked up by some one member deputed for the purpose, and who had particularly devoted himself previously to the subject upon which they had agreed to report. Amongst other subjects which could be advantageously taken up by such a committee would be the one alluded to by the Chairman, namely, the "Effect of Cultivation upon Medicinal Plants." The importance of collecting information upon this matter, he had on various occasions alluded to in his lectures, etc. (Pharm. Journ. N.S. vol. iii. pp. 432, and 474–478). Professor Bentley also dwelt somewhat in detail upon the necessity of collecting information as to the comparative medicinal activity of plants growing wild in different parts of Great Britain. He was persuaded that it would be found that plants even in such circumstances would vary greatly in properties, according to the local conditions under which they were placed.

He concluded by moving the following resolution:—"That it is desirable that an Association be formed, to be called the British Pharmaceutical Conference, for the purpose of holding in the provinces an annual meeting of those engaged in pharmacy."

Dr. ATTFIELD seconded the resolution. He referred to the numerous letters which he had received from gentlemen who were unable to attend on the present occasion, but many of whom expressed the hope of assisting in future conferences. The amount of support now guaranteed to the movement was amply sufficient to carry out to a successful issue the objects which they had proposed to themselves to accomplish. He was much impressed with the advantages which would accrue to pharmacy by the systematic arrangement of subjects for original research. There would be no difficulty in finding proper subjects for investigation; the question of medicinal herbs, as alluded to by the Chairman and by Professor Bentley, would afford a field of operations for many labourers. We knew that an endless variety of products resulted from the vital processes of plants, and with the chemistry of a large number of these products we were totally unacquainted. For instance, the variety of flavours and odours of plants were due to essential oils, and it was desirable that these principles should be isolated and examined in many cases in which this had not yet been done. Such an investigation would be sure to contribute to the store of our chemical knowledge. Many members of the class of alkaloids were still subjects upon which we had much to learn.

Mr. GROVES wished to inquire whether membership in the Conference was to be limited to those who belonged to the Pharmaceutical Society. He did not wish to express the opinion that it should be so, but thought they should consider the point before this resolution was put to the vote.

Mr. BRADY replied that the originators of the movement had all along contemplated the adoption of a broad and liberal basis, and, individually, he hoped that no such limitation would be created. This feeling was evidently general in the meeting, and it was further pointed out that membership must not be limited to those actually engaged in the practice of pharmacy, since this would exclude professors, medical men who might be especially interested in the subject, professional chemists, and the cultivators of medicinal herbs. The resolution was then adopted unanimously.

The CHAIRMAN called upon Mr. Brady to introduce the draft of a proposed

Constitution and Rules. These were considered *seriatim*, and in the form finally adopted are given below. The discussion which occurred was conducted in the most friendly manner, and the alterations made in the original draft were not great. The name adopted was believed to convey a better idea of the objects of the Society than any other would, and it was one that could not be confounded with other Associations. Upon the same principle, it was felt that Article II. of the Constitution would prevent any suspicion that the Conference would be employed for purposes foreign to those put forward by its promoters.

CONSTITUTION.

Art. I.—This Association shall be called the British Pharmaceutical Conference, and its objects shall be the following:—

1. To hold an annual Conference of those engaged in the practice, or interested in the advancement of Pharmacy, with the view of promoting their friendly reunion, and increasing their facilities for the cultivation of Pharmaceutical science.
2. To determine what questions in Pharmaceutical science require investigation, and, when practicable, to allot them to individuals or committees to report thereon.
3. To maintain uncompromisingly the principle of purity in medicine.
4. To form a bond of union amongst the various associations established for the advancement of Pharmacy, by receiving from them delegates to the annual Conference.

Art. II.—Membership in the Conference shall not be considered as conferring any guarantee of professional competency.

RULES.

1. Any person desiring to become a member of the Conference shall be nominated in writing by two members, and balloted for at a general meeting of the members, two-thirds of the votes given being needful for his election. If the application be made during the recess, the Executive Committee may elect the member by a unanimous vote. Every member shall sign an obligation to conform to the rules of the Conference for the time being.
2. The subscription shall be 5*s*. annually, which shall be due in advance, upon July 1.
3. Any member whose subscription shall be more than two years in arrear, after written application, shall be liable to be removed from the list by the Executive Committee. Members may be expelled for improper conduct by a majority of three-fourths of those voting at a general meeting, providing that fourteen days' notice of such intention of expulsion has been sent by the secretaries to each member of the Conference.
4. Every association established for the advancement of Pharmacy shall, during its recognition by the Conference, be entitled to send delegates to the annual meeting.
5. The officers of the Conference shall be a President, four Vice-Presidents, a Treasurer, two General Secretaries, one Local Secretary, and nine other members, who shall collectively constitute the Executive Committee. Three members of this Executive Committee to retire annually by ballot, the remainder being eligible for re-election. They shall be elected at each annual meeting by ballot of those present.
6. At each Conference it shall be determined at what place and time to hold that of the next year.
7. Two members shall be elected by the Conference to audit the Treasurer's accounts, such audited accounts to be presented annually.

8. The Executive Committee shall present a report of proceedings annually.

9. These Rules shall not be altered except at an annual meeting of the members.

10. Reports on subjects entrusted to individuals or committees for investigation shall be presented to a future meeting of the Conference, whose property they shall become. All reports shall be presented to the Executive Committee at least fourteen days before the annual meeting.

It was proposed by R. Parkinson, Ph.D. (Bradford), seconded by Mr. Metcalfe (Hull), and carried unanimously, "That the following be elected officers of the Conference for the current year:"—

President: H. Deane, F.L.S.

Vice-Presidents:

T. Redwood, Ph.D., Sec. C.S.
Prof. Bentley, F.L.S., M.R.C.S.
J. B. Edwards, Ph.D., F.C.S.
R. W. Giles, F.C.S.

Treasurer: H. B. Brady, F.L.S., etc.

General Secretaries:

J. Attfield, Ph.D., F.C.S.
R. Reynolds, F.C.S.

Local Secretary:

J. C. Pooley.

Committee:

S. Gale, F.C.S.
T. B. Groves, F.C.S.
D. Hanbury, F.L.S.
A. F. Haselden.
B. S. Proctor.
W. D. Savage.
F. Sutton, F.C.S.
J. P. Tylee.
E. Wood.

It was proposed by Mr. Barford (Wellington College), seconded by Mr. E. Wood (London), and unanimously agreed to, "That the next meeting of the Conference be held at Bath."

It was moved by Mr. Howson (Gateshead), seconded by Mr. Greaves (Ironville), and carried, "That the following be appointed a Committee on Adulterations, and requested to report to our next meeting, viz. Dr. Attfield, Mr. T. B. Groves, Mr. B. S. Proctor, Mr. Rimmington, and Mr. F. Sutton."

Professor Bentley moved, and Mr. Gale seconded, a vote of thanks to the original conveners of the meeting,—Dr. Attfield, Mr. Brady, and Mr. Reynolds.

A vote of thanks to the Chairman being passed, those present enrolled themselves as Members, and the meeting adjourned until 8 P.M.

It was arranged that those who had already taken a part in promoting the Conference might be admitted as members without being balloted for.

Evening Meeting.—The President took the chair at 8 P.M., and called upon Mr. B. S. Proctor to read a paper upon "Weights and Measures."

This communication gave proofs of much careful thought upon the subject, and the author was by no means disposed to accept the decimal system as being the best that could be devised. He pointed out several faults in the metric system as used in France, and said that if he had to choose between an octavial, a decimal, and a duodecimal system, he would feel some hesitation in deciding whether the first or the last was the better, though he felt no doubt of their

both being better for commercial purposes than the decimal; but if his choice was between the decimal system and the present want of system, there could be no doubt that a change would be for the better. He then drew attention to the cost of making a change, and gave several suggestions for diminishing the inconvenience of the transition state.

Mr. E. WOOD confessed that he had once regarded the decimal system as being almost perfect, but further reflection had brought him to a conclusion similar to Mr. Proctor's, and he was very much of a convert to an octavial method.

Mr. F. SUTTON (author of the 'Handbook of Volumetric Analysis') said, that he had used the metric system for five or six years in his own laboratory and was well satisfied with it. It must now be accepted as the universal system of men of science throughout the world. He hoped to see it introduced into dispensing, and that if the old weights and measures were retained in the forthcoming British Pharmacopœia, their equivalent value might be also given according to the metric system.

Mr. BRADY suggested the appointment of a Committee to whom the subject might be referred.

Mr. MAWSON wished to recall the meeting to the fact that the adoption of the decimal method had become a practical question for the legislature. Its principle had been sanctioned by the vote of the House of Commons, and doubtless a Bill upon the subject would again be introduced next session. The decimal system therefore was likely to be attained, which the octavial was not.

Mr. HEATHFIELD said that the assayers of London used the decimal system in operating upon the precious metals.

Dr. EDWARDS strongly deprecated the use of old names in any new systems of weights and measures that might be introduced. For instance, the adoption of the terms "quart," "pound," and "ounce," in our present imperial system had led to constant misunderstandings, since those terms were preoccupied in other tables. He hoped a new nomenclature would be introduced with any new system. He concluded by proposing "That Mr. Proctor is requested to continue his attention to the question of a new system of weights and measures in pharmacy, and report thereon to our next meeting."

Mr. MAWSON seconded this resolution, which was carried.

Mr. REYNOLDS then brought before the meeting four cases of glaring adulteration or fraudulent substitution which had lately come under his notice, and illustrated them by exhibiting the substances in question. They were the following:—

1st. An article professing to be Howard's disulphate of quinine, which had been sold at sixpence per ounce under Howard's current price. This called attention to the matter, and analysis showed the article to be entirely sulphate of quinidine. It was singular that in looking over the salt, some fragments of green sealing-wax were found, this being the colour used by Messrs. Howard for sealing either the bottles or the tins of the quinidine salt.

2ndly. Tartaric acid, which was not a substance generally supposed to be tampered with, had lately been made the subject of frauds upon a very large scale. A house engaged largely in tartaric acid had commanded the market for some time by their power of selling a shade below any one else. An analysis of this acid had once been made, but as no alum was found, it was reported genuine. Some of it was bought by a confectioner and found not to produce the usual effect, and it was then submitted to examination again. The result was that from 12 to 17 per cent. of Rochelle salt was detected, the particular sample shown containing 12·1 per cent. This gave 5·2 per cent. of ash when incinerated.

3rd. The frauds practised in chloride of gold for photography had already been exposed by Mr. Reynolds (Pharm. Journ. ser. 2, vol. ii. p. 372), and he had to report that they still continued. The tube exhibited had contained such a salt. It was about three and a half inches long, was wrapped in green paper, and had a red label, "Chloride of Gold, 15 grains." The actual weight of the contents was 14·05 grains, but it only yielded 5·1 grains of pure gold instead of 7 grains, which it ought to have done. He had again examined some made by a firm who guaranteed 7 grains of gold in the bottle, and found precisely that amount. He had been confirmed in the belief that "honesty is the best policy," by what this firm had told him, viz. that when they adopted the principle of a guarantee, their sale for the article multiplied by ten in a very short time.

4th. The powdered opium exhibited had been supplied to a medical charity in Leeds by a London house. It contained 25 per cent. of mineral matter (sand and earth), whilst there was a very large excess of the poppy capsules, which gave it a speckled appearance. It had not been tested for the percentage of morphia.

Mr. Reynolds thought that these instances would suffice to show that there was an ample field of operations for the committee on adulterations which they had just appointed.

The PRESIDENT, Mr. MAWSON, and Mr. GREAVES expressed their satisfaction at seeing such steps taken towards the exposure of fraud, and the company adjourned to supper.

The Supper.—Most of those who had taken part in the meetings just described met again at an excellent supper provided at the Turf Hotel, and received some reinforcements of friends. The President occupied the chair, and Dr. Edwards acted as vice-chairman.

After the usual loyal toasts, the PRESIDENT said that in reflecting upon the object of their gathering that day, it was impossible not to think of the hearty and sagacious support which the present undertaking would have received from one who was for many years esteemed and beloved by them all, but who was now removed from these earthly labours. Nevertheless, he had left a memory which was yet fresh in all their hearts, and which would long be cherished as a pattern of self-denying devotion to the elevation of his professional brethren. He would now only give "The Memory of Jacob Bell," which was drunk in deep silence.

"The Pharmaceutical Conference" was responded to by Mr. BRADY, who expressed his satisfaction that Newcastle had had the privilege of receiving its first meeting, and he could promise a hearty welcome whenever the Conference was again disposed to visit their town. He concluded by proposing "The Strangers," responded to by Mr. Reynolds, who intimated his gratification at the complete success of the experiment they had made in holding a conference. Questions had many times been put to him as to their proposed constitution and objects. Previously to that day, no individual could claim to speak with authority as to their intentions, but they had now adopted with perfect unanimity a liberal "platform," and they might anticipate that it would bring a good muster at Bath next year.

To the toast of "Other Associations for the Advancement of Pharmacy," Dr. EDWARDS replied in a humorous speech. He claimed for the new organization the best wishes and anything more of "the old lady in Bloomsbury Square." It was she who had rendered this movement possible by her school of pharmacy, which many at that table hailed as their *alma mater*.

Mr. SUTTON gave "Our Friends at Newcastle," and spoke justly of the unbounded hospitality which had been shown by the citizens of that town. Mr. MAWSON returned thanks.

The last toast, "Our Visitors," brought up Mr. Jos. BECK and Professor ARCHER. The former alluded to the many ties existing between his firm, as makers of microscopes, and the pharmaceutical body. He anticipated the multiplication of these reciprocal ties as a consequence of every movement to forward the progress of pharmacy, but even at the present time pharmaceutists were the best friends they had.

Professor **ARCHER** spoke at some length, and expressed the great interest which questions in pharmacy had for him, and he could not comprehend how it should be otherwise with any educated man brought into contact with the numerous interesting matters belonging to it. He had been much abroad of late, and knew the position taken by their Continental brethren; and if they would allow him to give a word of counsel, it was, to aim high enough. Let them always maintain their right to be considered an essential branch of the medical profession.

ORIGINAL AND EXTRACTED ARTICLES.

THE JOURNAL.

BY MR. JOSEPH INCE.

Most of us remember well the manner in which we wrote themes at school. Given, a particular vice,—say, for instance, Envy,—and we remarked infallibly, "Of all the vices that disturb the human breast, that of envy is the most baneful and pernicious. Butler, with his usual sagacity, has well observed [here quotation from the 'Analogy']; and even Gibbon, in-spite of his scepticism, avers" [fill up with a passage from the 'Rise and Fall'].

Nor when the medium of a learned language was enforced did the mode of inspiration vary.

Fiducia is not a startling excellence, yet, beyond all question, we commenced as follows:—"Omnium virtutum quæ [sentence from Ainsworth's Dictionary] non dubitandum est, quin Fiducia præclarissima et maxime nobis laudanda sit." Cicero now took the place of the pious bishop; but in the main the two themes betrayed a common origin of species.

Years bring experience, and in later life we learn to moderate our lights and shadows, and to recognize as at least one qualification in a writer, that he should distinguish between things that differ. Notwithstanding which judicious observation, I am about to preface my remarks with the old stereotyped phrase, and to state that of all the journals difficult to conduct there is none more difficult than our own.

This is the key to the enigma, that not only is the Journal the representative organ of a Society, but that the Society it represents is essentially unique in its constitution. So obvious has the difficulty appeared, that it has been suggested that the Journal should be abolished, or, were that extreme measure not carried out, that at least its organization should be remodelled, that henceforth it should cease to be distributed gratuitously to the members, that it should run its chance with periodicals of kindred nature, and thus reap the advantage which the impetus of competition can alone bestow.

Both suggestions are the result of a want of knowledge. The question to be decided is whether the Society, as such, be worth maintaining? whether the advantages resulting from its establishment be true or false? Some years ago it was perceived that England was the only place where the pursuit of pharmacy was not accompanied with honour; where no qualification was exacted, educational or otherwise, and where the balance was held with rigid impartiality between grocery and physic. It was determined (rightly or wrongly it is not the present business to decide) to change the system, to elevate the pharmaceutist, and thus indirectly to advance the interests of the public. It was thought that the man would be more satisfied with a higher standard of acquirement, and the world in general more content to entrust matters of life and death in the hands of a competent individual rather than in those of an ignoramus. Under this impression was founded what is called the Pharmaceutical Society, essentially an educational and preparatory establishment. It was deemed logic that a sound

practical instruction was not likely to upset the prospects of even a chemist and druggist. Now if this theory be true, its details must be from time to time brought before the world; there must be a record of its transactions, a vehicle for the interchange of sentiment between its members; there must be an official chronicle of its various doings. Hence the necessity for the Journal. No Journal, no Society: they stand or fall together.

Being, then, both the property and representative of the Society, indeed its visible embodiment, it is shut out from many of those aids and appliances which materially favour the welfare of an irresponsible periodical. Gladly would any editor welcome the breath of competition, with its healthy stimulus to exertion, imparting inevitably a vitality which, if not real, is galvanic; but from the moment the Journal had to trust only in its own resources, though its success as a work of literature might be enhanced, its essential character would cease.

No journal can hope to compete with proprietary periodicals that is under the hard necessity of being indebted for its support to unpaid contributors, unless we can reckon on some considerable amount of self-devotion. Literature is a poor living, but an excellent assistance; and a writer soon discovers that though he may be neither Bulwer nor George Eliot, he may, without overstraining his capabilities, realize sufficient by his pen to clothe himself from head to foot. No young man of good education and industrious habits needs to starve, so long as literature retains amongst her patrons Charles Dickens, Chambers, or John Cassell.

Pharmaceutists of moderate income and of good ability are not slow to avail themselves of such aid; and this must be counted as one of the hindrances of an editor who can offer no other remuneration to his contributors than a sense of honour.

This intrinsic difficulty is increased by the special character of the Society represented. It is formed of a community of persons of more or less scientific tendencies, with pecuniary trade interests. It is the nature of their actual occupation that their trade success depends upon the possession of certain formulæ which they or their fathers have discovered, or else on the adoption of forms of manipulation which have won favour from the public. Not one fraction of this special information will ever find its way into the columns of a monthly periodical. In class journals connected with the arts the trade interests of contributors are protected by patent rights: mere business circulars have little to conceal. 'The Horological' is glad to advertise its watches, and 'The Grocer' to exclaim, "In the name of the prophet, figs!" This is a stumbling-block to that large class of readers who so amiably accept scraps of intelligence on trade minutiæ as information. When a new publication starts on its perilous career, there is a marvellous supply of advice gratis shot into its pages, ranging from theories on the comet to a receipt for blacking. Many readers are enchanted, though had they referred to an old file of the 'Family Herald' they might have wondered at the similarity of facts. Of one thing they may rest profoundly sure, that with regard to the minor details of pharmacy they will never get beyond Cooley's 'Practical Cyclopædia' or Beasley's admirable compendiums. Let us at once admit the existence of these peculiar trade interests, and then we may more readily understand the inevitable bias towards generalization, and the selection of subjects of scientific rather than of immediate daily interest.

But if there are difficulties inherent to the actual position of the Journal, there are others which should not certainly exist.

In the last financial report of the Council occurs this item:—"Expenditure: Journals, postage, etc., £173. 13*s.* 4*d.*" Knowing the financial working of another journal (non-pharmaceutical), I took the amount stated for a misprint; nor was I enlightened until reading the discussion which ensued. Some present

took exception to the homœopathic figures, and a member of the Council had to explain that "Members generally would be glad to know that the cost of the Journal, beyond the amount expended for wrappers and postage, was only £4. Of the £173 that had been referred to, £169 was actually spent in postages and wrappers." I am not glad to know it. When a friend of mine comes on the parish, I accept it as a dire necessity, and I am not in a state of jubilation that his living should be so cheap; and I feel sure that so long as members are proud of floating the Journal on so wretched an ebb-tide it will not reward the Society as a source of profit.

Lastly, there is one giant difficulty, which, if once removed, would cancel all the rest. I have thought it right unshrinkingly to point out actual hindrances, conscious that a known danger is half met, and that thus from our inherent weakness we may be driven to our true source of strength. Let us not be a Society in name, and let the eternal distinction between London and the country cease. With the exception of a few London members, the idea has never yet been practically received that the Journal is our own representative, and that we all, whether in town or country, are answerable for its success. To judge from appearances, there is an impression that it can produce itself; that by some mysterious conjuring it is safe to come together, and that the requisite number of sheets and pages will make their due appearance on the first of every month. Glancing at the index at the close of each succeeding volume, it transpires that its entire compilation is due to the energy of about a dozen writers. Here and there, at spasmodic intervals, appears a letter, complaining bitterly that the subjects treated of are monotonous, that trade interests are neglected, and that practical communications are angelic in their visits.

Happy for the poor editor of not his own, but a brother member's journal, if this be all. Up comes an epistle, branding his Society as a mistake and consigning his Journal to the butterman. Such a communication has just been received from a marine member of many years' standing. It may be epitomized in three heads, thus:—1. He has watched the Society going gradually to the bad; it has now reached its culminating point, and had better close, start fair on a retrograde basis, and hope, in the course of years, eventually to become what it is. Poor Society! it seems as often under repair as the pump in St. James's, Piccadilly, which useful hydraulic apparatus has just disappeared altogether. 2. He and some friends (names not given) prefer assistants who know nothing, and whose qualification has been to jump from behind one counter to behind another. 3. He has never received a hint of the slightest benefit from his Journal, although he is making pounds by information gained elsewhere.

Now, as a London member, I also may be allowed to register a grievance. I have been for many years connected with the Journal as reader and contributor, and to the best of my knowledge I have never yet received a spark of practical intelligence from this particular correspondent, though perhaps this is one of the errors about to be remedied in future.

Upon what ground do not occasional complainers (taking no other share in the Society's transactions) instantly set their shoulders to the wheel to effect a change? Why not, from their own experience, furnish something to the common store? I believe it to be in the power of every well-educated pharmaceutist, from time to time, to write some true and sensible and instructive things. Let us have this real help, instead of vain tirades about the Society and the poverty of its literary productions. Members of the Society, take your own affairs into your own hands; become the personal conductors of your own Journal, and before the opening of a new year it will not only stand before the world as your real instead of official representative, but also be the best practical exponent of English pharmacy.

26, *St. George's Place, Hyde Park Corner.*

INTRODUCTION OF CINCHONA INTO INDIA.

(*Concluded from page* 109.)

In a letter from Mr. Markham to Mr. Baring M.P., the important fact was placed before the Government that in order to ensure the successful issue of any enterprise having for its object the introduction of cinchona into India, it was most desirable that plants or seeds of *all* the more valuable species should be obtained. To this end Mr. Markham advocated that four separate expeditions should be sent to South America,—one proceeding either to Bolivia or to the Peruvian province of Caravaya in order to procure *Cinchona Calisaya* and *C. micrantha*,—a second which should visit the forests of Huanuco and Huamalies, 250 miles from Lima, there to obtain *C. nitida* and *C. glandulifera*, the sources of the valuable Grey Bark,—a third which should search the slopes of Chimborazo and bring thence the tree yielding Red Bark, and also the varieties of *C. Condaminea* which afford the well-known Crown Bark of Loxa;—while a fourth expedition should be entrusted with the duty of obtaining the Cinchona Bark trees of New Granada.

The Government acceded as far as it was possible to this wise proposition, in consequence of which Mr. G. J. Pritchett proceeded from England to Lima and thence to the city of Huanuco situated on the eastern slope of the Andes, where he arrived on the 28 May 1860. "The time of my arrival" writes Mr. Pritchett, in his dispatch to the Under-Secretary of State for India

"was unusually favourable for gaining information on every point that might be necessary, and ready and eager replies were given to my inquiries, in consequence of the expectations of the inhabitants being at the highest respecting the future prosperity of their city, on account of a grand road, which was already commenced, for connecting the province of Huanuco with the river Ucayali (about 50 leagues to the east), the largest and most important of the southern tributaries of the Amazon.

"Arriving at this time, with introductions from members of the Government in Lima, and not having anything to do with the usual objects that take people to Huanuco, it was impossible that the popular mind could allow me to pass unnoticed. To me, therefore, was assigned the post of emissary from the Government for ascertaining the most suitable point on the Ucayali which should be made the terminus of the road, with the view of connection with the Amazon by large steamers on the former river.

"Provisions of dried meat, biscuit, lard, rice, tea and coffee, sugar, spirits, tin teapot and mug (the spirits being the most important of all in the damp forest) being ready, I left the city of Huanuco for the forest on the 9th June, having been delayed there twelve days by these indispensable preliminaries.

"The road to the bark district (I should say to the centre of the district, as it extends from north to south over a distance of at least from 40 to 45 leagues) lies to the eastward, the first part of the road, for about 5 leagues, being down the valley of Huanuco, and more or less along the river's bank. Sugar-cane estates occupy the land on either side, whose products supply the mineral district of the Cerro de pasco with large quantities of the *aguardiente*, the rum of the country, and is a source of extensive support and profit to the inhabitants. The whole of the cultivation is by irrigating canals from the river, a system most thoroughly understood by all the Indian population of South America.

"Leaving the valley of Huanuco, the road strikes off to the left, in a northerly direction, gradually ascending from the river, in the direction of the highest part of the chain of mountains, at the top of which is Carpis, and at a distance of about two leagues is the village of Acomayo. This is the halting place generally adopted by travellers leaving Huanuco, on account of eggs and alfalfa being both obtainable here, and the necessity for giving a good rest to the mules before attempting the pass of the mountain. It was my fate to both ascend and descend this mountain on foot, on account of the unusually unfavourable state of the road at the time of my entering the forest.

"The great mountain range of Carpis may be considered the outpost of this part

of the forest. On one side, from its towering elevation, you look over the boundless sea of forest vegetation to the eastward; on the other, in the direction of the Cordillera and Huanuco, the prospect consists of every form of bare rock and arid mountain, except in those few instances where the bed of a valley is visible, and the green patches of irrigation can be distinguished.

"On the forest side, the vapour and cloud which rise are continually bathing the woods, which seem at this spot to be the perpetual focus for the converging clouds. They are carried over the tops of the range towards the more heated plains of Acomayo, and bear with them in that direction, for a short distance, their beneficial and nutritive influence, though it does not extend above a league or a league and a half.

"The atmospheric changes which rapidly take place at this point are very great, every vicissitude of temperature being experienced here within a few hours,—at one time, a raging tempest of rain and wind,—at another, the calm, tranquil, leaden atmosphere of chilling cloud and fog. I presume the almost fathomless depths of the water-worn abysses of the forest, the great proximity of their sides to each other, at the same time that they are under the influence of a tropical sun, will account for these phenomena."

The limits of a journal will not admit of our quoting the whole of this interesting letter, which goes on to describe the localities in which were found *Cinchona purpurea*, *C. nitida*, *C. oborata*, and *C. micrantha* var. *provinciana* and var. *Pata de Gallinazo*. The trees however had just passed the flowering season, so that careful observation was necessary for the discrimination of the species. Here let us again take Mr. Pritchett's words:

"On the arrival of Juan (my bark guide), I immediately set to work to determine the capacity of our new scene of labour for producing cinchona seed, and daily were the trips made into its woods for that purpose. But it was soon clear that, however much was met with, and seemed merely to require a few days to ripen, nothing could be done for the present, as the capsules were only recently formed.

. . . .

"Being entirely satisfied as to the existence of the seeds at this point, I now only felt great anxiety about the weather. Although it was then about the middle of the dry season, heavy soaking rains were still falling from day to day, and the seed seemed to make no progress whatever towards maturity.

"Towards the latter part of July the weather broke up, and the sun began to make impression on the solid banks of clouds that filled the valleys. Though clouds were the prevalent visitants during this so-called dry season, there were occasions, during some portions of the day, when the sun unveiled, and even penetrated to the very underwood of the forest.

"But even to the last day of my remaining here, when we had nearly a fortnight's fine weather, with only an occasional shower, the tracts were still deep with mud, and only in the exposed situations could the mud be found less than ankle-deep. This fortnight of fine weather was the harvest that was necessary to be fully improved.

"The rapid ripening of the seed kept as many hands as I could procure from the hacienda, occupied in felling the trees and stripping them of their seed. After various trials, I found that the felling of the tree was the best way of proceeding under my present circumstances. My time was very short, and the quantity of seed suddenly ripened so plentiful, that to attain my object of getting a good supply of it, I could afford to be extravagant; and although much more seed was lost than was gathered, still my limited time compelled me to adopt this plan.

"During the fortnight we were engaged in this work, seven large trees were felled daily, and denuded of their capsules. At the same time the drying process had to be attended to in the hacienda, and every advantage to be taken of the sunshine, while the seeds were carefully protected from the breeze, which, with our utmost care, did not fail to deprive us of some of them. Our spoil having been so hardly earned, ensured this part of our operations being carried out with a jealous care, and the loss in this respect was reduced to a minimum.

"By the 13th August, when it was necessary for me to leave, in order to arrive in Lima by the end of the month, the seeds were all carefully put up in outside wrappings of tar-cloth, and every precaution taken to protect them from external influence. The

small plants had been brought in and packed in bundles, between layers of the cryptogamous parasites of the coca-shrub, overlaid with coverings of palm-branches bound tightly together, and then enveloped in several thicknesses of the woollen fabric of the country called *xerga*. . . .

"They were in perfect health when put into the Wardian cases in Lima, as also when they arrived at Southampton."

Among those employed in the enterprise of collecting seeds and young plants of Cinchona, no one displayed a greater amount of tact, industry and patience, and none so great capacity for observation and such great botanical knowledge as Mr. Richard Spruce, the gentleman whose services were secured for obtaining the Red Bark. Mr. Spruce, who is well known in the botanical world, had been already several years in South America when he was invited to superintend an expedition which should visit the forests of Ecuador whence this precious bark, now constantly becoming more scarce, is derived. His report on this expedition occupies 52 folio pages and includes not only a narrative of his proceedings, but most interesting information on the botany, zoology and meteorology of the bark-yielding forests covering the lower slopes of the snowy Chimborazo. It is no easy task to epitomize such a report, nor would an epitome convey the vivid descriptions with which it abounds. All that we shall therefore state is, that in the commencement of the year 1860, Mr. Spruce having purchased permission from the persons renting the forests of Chimborazo, or as they are called *of Guaranda*, to collect seeds and young plants of cinchona, visited those forests (which cover an area of some 2000 square miles) in company with Dr. Taylor of Riobamba and Mr. Cross; and that amid innumerable difficulties arising from the politically-disturbed state of the country, a fearfully unwholesome climate and defective means of communication, a goodly collection of seeds and young plants of *Cinchona succirubra* was at length gathered. Of seeds, this collection numbered at least 100,000, while of plants, 637 were placed in Wardian cases for transmission to Europe and thence to India, in which latter country, namely at Ootacamund, 463 plants conveyed thither by Mr. Cross, arrived in good order.

The impaired state of Mr. Spruce's health precluding the possibility of further exertions, Mr. Cross, who had returned to South America from India, was authorized to proceed to Loxa in order to make search for *Cinchona Condaminea*, the source of Crown Bark. The zeal and intelligence which Mr. Cross had displayed in his previous expedition, when acting as assistant to Mr. Spruce, did not fail him on the present occasion; and in the face of an edict of the Government of Ecuador prohibiting the exportation of either seeds or plants of the quina-tree under a penalty of 100 dollars for every plant or drachm of seed, he boldly started from Guayaquil in an open rowing-boat for Santa Rosa, a voyage of three days. Travelling over an exceedingly rough country during which he lost a mule, which was dashed to pieces while crossing a lofty precipitous ridge, he reached Loxa on the 27th September, 1861,—ten days after leaving Guayaquil. Much inquiry was here necessary in order to discover *where* any cinchona-trees could still be found, no one, it would seem, having any certain knowledge on the subject. At length, however, Mr. Cross heard that on the Sierra de Cajanuma, a low ridge of hills some eight miles south of Loxa, the bark-tree was still to be met with: and so he found it to be, though the trees were mostly of small dimensions and growing on precipitous places; few of them, moreover, bore any capsules. In this neighbourhood however, he established himself, and by dint of diligently searching the ravines from sunrise to sunset, day after day, contrived to collect a considerable supply of ripe seeds, which were transmitted to Guayaquil and thence, by way of London, to India. These seeds, which were gathered in September, germinated freely at Ootacamund in the following February.

Mr. Cross gives the following account of *Cinchona Condaminea* (var. *c. vera?*):

"The *C. Condaminea* is a slender-growing tree, from 20 to 30 feet in height, and from 8 to 10 inches in diameter at the base. But few trees are to be seen of these dimensions. The plants from which the bark of commerce is now taken are, in general, not more than 8 to 10 feet in height. When the plants are cut down, three or four young shoots or suckers in general spring up; but this does not always happen, as some of the more industrious cascarilleros frequently pull up the roots and bark them also. The bark is taken from the smallest twigs; thus the annual growths are sometimes taken, especially if they are strong. The plants are sometimes found growing in little clumps, and sometimes solitary, but always in dry situations. The temperature of the cinchona region ranges from 34° to 70° F.; it seldom however, falls below 40° and rarely rises above 65°. The general range of the temperature is from 45° to 60° F.

Another and important source whence seeds and plants of cinchona have been introduced into British India, has been Java, in which island, as is well known, the earliest attempts to cultivate the tree were made under the auspices of the Dutch Government. The plants of *Cinchona Calisaya* which were collected in Peru, having been exposed to intense heat during their transit down the Red Sea and subsequent detention at Bombay, suffered an amount of injury, from which no nursing would restore them; and though in the hands of Mr. McIvor of Ootacamund, who has since shown himself to be the most skilful cultivator of cinchona, every plant ultimately perished,—a loss which rendered apparent the wisdom of Mr. Markham's suggestion that the introduction of the cinchona should not be allowed to depend upon the success of a *single* importation. At this juncture, a correspondence was entered into with the Governor-General of Netherlands India, which resulted in the liberal offer of a supply of plants of *Cinchona Calisaya*, to receive which and to inspect the plantations in Java, Dr. Anderson of Calcutta was dispatched to Batavia. He returned in November 1861, bringing with him seven Wardian cases, containing 412 young and healthy plants of *Cinchona Calisaya*, *C. Pahudiana*, and *C. lancifolia*, besides 400,000 seeds.

The chief cinchona plantations in India are on the slopes of the Neilgherries in the Madras Presidency, where the climate and soil bear a close resemblance to those of the Andes. Cinchona-cultivation has also been commenced at Darjeeling in British Sikhim, where 1611 plants were growing on the 1st August, 1862; it is also being carried on with success in Ceylon, where many hundreds of plants are progressing satisfactorily under the care of Mr. Thwaites, director of the Royal Botanic Garden at Peradenia: of each undertaking the Parliamentary Return contains full reports. There is also a prospect of the cultivation being speedily commenced in other parts of India. Cinchona plantations have likewise been established in Jamaica and Trinidad.

The French Government has likewise taken in hand a project for cinchona-culture in Algeria, for which purpose a grant of from 200 to 300 young plants has been made from the Royal Gardens at Kew.

NOTES FROM NEWCASTLE.

BY S. GALE, F.C.S.

A marked feature in the visit of the British Association to Newcastle was the liberality with which the manufacturers threw open their works for the inspection of the members. Among the most interesting of these works were those of Aluminium at Washington, belonging to I. Lothian Bell, Esq., the present Mayor of Newcastle.

Aluminium.—The properties of aluminium were first investigated by Wöhler,

who obtained it in the form of a grey powder, but in subsequent experiments he succeeded in getting malleable globules. It is however only within the last few years that the experiments of M. Deville have been successful in reducing the cost of manufacture to such an extent as to turn it to useful account. The sources of alumina, from which it is obtained, are abundant, but the difficulty has always been in finding a substance that would yield it pure. It was first extracted from ammonia alum of commerce, which, on heating, produces alumina, but the impurities in the shape of silica and iron, which could not be got rid of, contaminated the product. After this, cryolite (a double fluoride of aluminium and sodium) was tried and abandoned for the present mineral bauxite (an aluminate of iron with a little silica), from which all the aluminium is now made.

The method adopted is to grind the bauxite to fine powder, mix it with carbonate of soda, and heat it in a furnace; by this means an aluminate of soda is formed; this is treated with water, which dissolves out the aluminate of soda and leaves the oxide of iron behind. The solution is then treated with hydrochloric acid, and the alumina is precipitated in a granular form, perfectly pure; this is well washed and mixed into a stiff paste with charcoal and chloride of sodium, afterwards made into pellets, and well dried. Then follows the next stage of the process; these pellets containing alumina, charcoal, and salt, are placed in a tube in a furnace and brought up to a red-heat, at the same time a stream of chlorine is passed through the tube; thus effecting the reduction of the alumina by the charcoal and forming a double chloride of aluminium and sodium, which sublimes as a yellow crystalline mass into an earthen pot placed to receive it. This double chloride is then intimately mixed with sodium and some cryolite, which is used as a flux, thus rendering the mass more fusible; this mixture is then placed in a furnace and strongly heated; as the sodium has a stronger affinity for the chlorine than the aluminium, it takes the chlorine and leaves the aluminium free; when heated sufficiently, the furnace is tapped and the silver-like metal flows out, and is carried away and run into bars each weighing about ¾ lb.

There are many purposes for which aluminium is desirable on account of its lightness, its specific gravity being 2·6. A bar of copper of equal size would weigh 2½ lb. It is largely used in making the alloy called aluminium bronze, which contains ten parts of aluminium to ninety parts of copper; this is likely to become popular in consequence of its colour, and its mechanical properties give it great value.

Sodium.—As the commercial success of aluminium depends upon the cheapness with which sodium can be produced, it may be interesting to hear that the latter is made at these works at ten shillings the pound, and the stock is about half a ton.

Sodium is obtained from carbonate of soda, and the process adopted is the following:—Dried carbonate of soda, powdered charcoal, and finely-powdered chalk are mixed intimately and kneaded into a stiff paste with oil, and calcined in a covered pot, the mass is then introduced into an iron retort and distilled; the sodium is received into a vessel containing mineral oil. A man constantly watches to prevent any obstruction in the tube, which is cleared by passing in an iron rod; the sodium is afterwards fused and run into bars.

Carbonate of Soda.—A few steps brought us to the building where carbonate of soda was being made, and we saw all the processes for its manufacture in operation; first, there was the common salt being acted on by oil of vitriol for the production of sulphate of soda, under the name of "salt-cake;" this is carried on in a reverberatory furnace connected with an apparatus for condensing the hydrochloric acid. This rough sulphate of soda is then mixed with chalk and powdered coal and thrown into a reverberatory furnace, and frequently stirred

until the mass is thoroughly melted, when it is raked out into a mould; on cooling, the loaf is turned out, and forms "black ash." The chemical changes which take place when sulphate of soda is fused with chalk and coal are, first, the deoxidation of the "salt-cake" and its conversion into sulphide of sodium with evolution of carbonic oxide; secondly, the formation of carbonate of soda and sulphide of calcium, the latter being rendered insoluble by the excess of chalk employed. The "soda-ash" is afterwards broken up and exhausted with warm water; it is then evaporated, and while hot is run into pans capable of holding a hundred and fifty gallons of liquid, and about one ton of crystallized carbonate of soda. The liquid cools in the course of four or five days. The crust of one of these pans was broken and a mass of large bright clear crystals exhibited to view.

Carbonate of magnesia is manufactured here, but by a very different process from that usually seen in the laboratory. Dolomite, the double carbonate of magnesia and lime, is powdered and exposed to a red-heat for two or three hours, by which means the carbonate of magnesia is decomposed. It is then mixed with water and introduced into an iron cylinder, into which carbonic acid is forced under pressure, the carbonate of magnesia dissolves out as bicarbonate, leaving the carbonate of lime behind; the clear solution when boiled deposits the carbonate of magnesia, which is drained and dried on stoves at a low temperature.

Mr. Bell has rendered service to science by collecting and preparing a considerable quantity of that interesting new metal—thallium—discovered by Mr. Crookes, and a bar of which was exhibited at the *soirée*. Thallium is contained in the iron pyrites used in making sulphuric acid; it sublimes as a sulphuret, and is collected with the flue-dust from the tubes through which the sulphurous vapours pass before going into the leaden chambers.

After seeing the process for the manufacture of sulphuric acid, we passed on to that of oxychloride of lead; this is made by decomposing a solution of chloride of lead with lime-water, and is used largely by painters in the place of white-lead.

At these works very great care is bestowed in the condensation of the gases, for notwithstanding the large volumes that are given off, we were particularly struck with the purity of the air.

338, *Oxford Street.*

REMARKS ON LEMON-JUICE AND ITS PRESERVATION.

The fact that prescriptions, ordering alkaline mixtures to be taken effervescing with lemon-juice, are often accompanied by instructions that "the lemon-juice is not to be sent," is both unpleasant and unprofitable. Unpleasant, as indicating suspicion on the part of the prescriber that the dispenser will not faithfully discharge his duty, in sending exactly what is prescribed, and thus weakening the confidence of the patient; unprofitable, as it deprives the pharmaceutist of a portion of his legitimate profit. Now as there can be no effect without a cause, so there must be a reason why the above instructions are so frequently received, and it appears to be just this:—Lemon-juice will not keep for any length of time if simply strained and bottled. Pereira and Royle, after stating this, give formulæ for its *artificial* preparation, and there can be no doubt that a substitute so prepared is largely used. This, in dispensing, is about as justifiable as extemporizing Inf. Cinchonæ by an aqueous solution of quinine and cinchonine. Yet who would countenance the latter? Royle also states that "druggists in this country preserve it (the fresh juice) by adding $\frac{1}{10}$ of spirit of wine, and filtering off the mucilage." Spirit is highly objectionable in cases for which effervescing

mixtures are usually prescribed, therefore this also would be inadmissible for dispensing purposes.

Undoubtedly, in some establishments, lemon-juice is preserved in the manner I am about to mention, but it is quite certain that in very many it is not; and they either follow one of the above practices, or make the necessary delay of procuring and pressing lemons, and straining the juice when required.

The process Mr. Alsop recommends* and Dr. Redwood has frequently advocated for the preservation of infusions, applies equally to lemon-juice, viz. heating to the boiling-point, and excluding the air by carefully closing the full bottles at this temperature. Thus prepared it keeps well for more than twelve months, but early last winter I made some experiments to ascertain if ebullition were really necessary, and I find it is not; juice heated only to 150° and excluded from the air at that temperature, is now in a perfect state of preservation. I cannot say, however, that this holds good if it be bottled during the summer months; in fact, my experience indicates otherwise.

This might arise from the juice, when expressed, being in an incipient state of change, as it is well known that lemons are very prone to decay at this season, and microscopic organisms being in a more vitally active condition than during the winter, are probably capable of sustaining a high temperature for a short period; and thus, although the heat applied might retard, it does not totally destroy the tendency to decomposition.

If a little care is exercised, stoppers or perforated corks are unnecessary, common corks answer quite well; and for covering the tops of these (when cut off), I think bees'-wax will be found superior to sealing-wax, as it adheres firmly and is not so liable to crack.

I would then suggest, that if a ten or twelve months' stock of lemon-juice is thus bottled at a temperature not necessarily above 150° *during the winter*, the dispenser would be enabled without delay to send it out in a state even superior to that freshly obtained from the fruits; and this being generally adopted would give satisfaction both to prescriber and patient.

CHARLES SYMES.

Leamington, Sept. 12, 1863.

INFUSUM CINCHONÆ SPISSATUM.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

I have more than twenty times made the above preparation; have always used Aqua Destillata, but on one occasion only have I noticed to any extent the deposition of Kinate of Lime. In this instance it formed around the bottle in large, well-defined, semi-opaque crystals; there was none of the usual deposit of extraneous matter after standing the twenty days.

The bark employed was a fair sample of Calisaya; fracture rather too *stringy* for that description of Cinchona, although sold as such. It did not yield more than two-thirds the amount of liquor (and that very pale in colour) I have generally obtained from the same weight of bark. In making this preparation, it will be found most economical to use the finest and *largest* bark, as an equal weight of the technically-called "small large bark" yields considerably less extractive to water, and this you find out in working to a specific gravity.†

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* See Vol. i., p. 58, 1st series.

† If specific gravity were insisted on in making certain tinctures, such as opium, digitalis, hyoscyamus, etc., it would tend greatly to regulate their strength; the last-named tincture (biennial leaves always used, et cæteris paribus), I have found to vary considerably in density. Tinctures of this class can be well made by *percolation*, and with a little management a uniform *density*, which I take to be the best criterion of *strength*, can always be ensured.

I must differ in opinion from Mr. Roberts as to the source from whence he obtains the Kinate of Lime. The first authorities tell us that it exists in all the Cinchonas. According to Bucholz's analysis, "Loxa Bark" contains nearly one and a half per cent. of this salt.

Park Terrace, Regent's Park. EDMUND WHITE.

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

The thirty-third meeting of this Association was opened at Newcastle-on-Tyne on Wednesday, August 26th. The attendance was unusually large, and financially the meeting must have been one of the most successful of the series. The arrangements made both for science and recreation gave universal satisfaction; and the fact that nine hundred ladies enrolled their names as members was a sort of guarantee that the lighter element of the meeting would not be neglected.

The meeting of the General Committee was held in the morning for the dispatch of business, and after the reading of the Report of the Council, was adjourned till the evening, when Professor Willis resigned the chair to Sir William Armstrong, who then delivered his inaugural address. The following is a list of the names of the officers of SECTION B.—CHEMICAL SCIENCE:—*President:* Professor A. W. Williamson. *Vice-Presidents:* Dr. Andrews, J. L. Bell, Professor Deville, J. P. Gassiot, Dr. Gladstone, Professor W. A. Miller, Dr. T. Richardson. *Secretaries:* Professor Liveing, A. Vernon Harcourt, H. L. Pattinson, J. C. Stevenson. *Committee:* F. A. Abel, Dr. Attfield, E. J. J. Browell, J. G. Barford, A. Crum Brown, R. C. Clapham, W. Crookes, H. Deane, G. C. Foster, Dr. Gilbert, G. Gladstone, Sir R. Kane, Dr. S. Macadam, Dr. Matthiessen, Dr. Paul, J. Pattinson, Professor Rowney, Dr. Murray Thompson, Professor Wanklyn, P. Worsley.

Professor WILLIAMSON said: One of the features of our science is the rate at which materials have been accumulating by the labours of chemists in the so-called organic department of the science. The study of the transformation of organic bodies leads to the discovery of new acids, new bases, new alcohols, new ethers, and at a constantly increasing rate. Some of these new substances are found to possess properties which can at once be applied to practical manufacturing processes, such as dyeing, but the greater number of them remain in our laboratories and museums, and text-books. New discoveries are constantly coming in to fill up the gaps which still disfigure our growing system. In mineral or inorganic chemistry, there is not the same scope for discovery at present, inasmuch as the elements which belong to it do not combine in those numerous proportions which occur among the chief elements of organic bodies. But yet, mineral chemistry has not been standing still, for even the heavy metals, most remote in their properties from those volatile and unstable substances of organic chemistry, have been got in many instances to combine together, and the organic metallic bodies thus formed have not only proved most valuable and powerful agents of decomposition, but they have served as a connecting link between the two branches of chemical science. A system of classification of elements is now coming into use, in which the heavy metals arrange themselves harmoniously with the elements of organic bodies, and in accordance with the principles which were discovered by a study of organic compounds. It is now many years since the attention of chemists was directed by a French professor to some inconsistencies which had crept into our system of atomic weights. Gerhardt showed that the principles which were adopted in fixing the atomic weight of elementary bodies generally required us to adopt for oxygen, carbon, and sulphur, numbers twice as great as those generally in use for those elements. The logic of his arguments was unanswerable, and yet Gerhardt's conclusions gained but few adherents. It is to be observed, that for some years Gerhardt represented chemical reactions by so-called synoptic formulæ, which took no account of the existence of organic radicals. These synoptic formulæ represent in the simplest terms the result of a chemical reaction; but they give no physical image of the progress by which the reaction is brought about. The introduction, in this country, of the water type in connection with polyatomic as well as monatomic radicals, was found to satisfy the requirements of the synoptic formulæ. Gerhardt was

the first to adopt them from us. He gave a system of organic chemistry on that plan, and his book has been of immense service to the development of our science. The extension of these principles to mineral chemistry had been commenced in the cases of the commonest acids and bases, but their general introduction met with difficulties, and sometimes seemed wanting to their complete success. I must now travel southward for a short time, and ask you to accompany me to that sunny land of glorious memories, and to its southern dependency—the island of Sicily. It was reserved for Professor Cannizzaro, of the University of Palermo, to show us how the remainder of the knot could be untied. He argued, upon physical as well as chemical grounds, that the atomic weight of many metals ought to be doubled, as well as those of oxygen, sulphur, and carbon. His conclusions are confirmed by the constitution of those organo-metallic bodies which I mentioned just now, and it certainly does seem to supply what was still wanting for the extension of our system of classification from the non-metallic elements to the heavy metals themselves. The elements are now arranged into two principal groups:—1. Those of which each atom combines with an uneven number of atoms of chlorine or hydrogen. 2. Those of which each atom combines with an even number of atoms of chlorine or hydrogen. Like every classification founded upon nature, this one draws no absolute line, as some elements belong to both classes. The first group includes the monatomic elements of the chlorine family, the triatomic elements of the nitrogen family, hydrogen and the alkali metals, silver and gold,—in all about eighteen elements. The usual atomic weights of these are retained. The usual atomic weights of all the other elements, biatomic, tetratomic, etc., are doubled. This second group includes the oxygen family, carbon, silicon, and the alkaline earths, the metals zinc, iron, copper, lead, etc. Every step in our theoretical development of chemistry has served to consolidate and extend the atomic theory, but it is interesting to observe that the retention of that theory has involved the necessity of depriving it of the absolute character which it at first possessed. Organic compounds were long ago discovered, containing atoms of carbon, hydrogen, and oxygen in proportions far from simple; and the atomic theory must have been abandoned but for the discovery that the atomic, or rather molecular, weights of these compounds correspond invariably to entire numbers of the elementary atoms. We now use the term "molecule" for those groups which hold together during a variety of transformations, but which can be resolved into simpler constituents; whilst we reserve the word "atom" for those particles which we cannot break up, and which there is no reason for believing that we ever shall break up. Amongst the most brilliant extensions of our means of observation have been the researches in spectrum analysis. The application of these beautiful methods to the investigation of minerals, has already led to the discovery of three volatile metals which had previously escaped observation, whilst its extension to the investigation of the light which reaches our planet from the heavenly bodies, has led to the recognition, in several of them, of elements identical, in this respect at least, with some of our elements in this earth. An eminent French chemist has recently taken occasion, in reporting the results of some researches on the new metal "thallium," to volunteer insinuations against Mr. Crookes's claim to that discovery. M. Dumas considers it corroborative of his views that Mr. Crookes did not refer the consideration of his claims, on the first opportunity, to a jury of gentlemen, formed for examining products of manufacturing industry at the National Exhibition of 1862. I have felt it my duty to allude publicly to this proceeding, because it occurred in a report of a commission of the French Academy, published by the order of that distinguished body.

The following is a list of the papers read in this Section:—

Address by the President.—Papers on Local Manufactures (Glass and Earthenware). Joseph Cowen, Blaydon Burn: Fire-Clay Goods. R. W. Swinburne, South Shields: Glass. C. T. Maling, Newcastle: Earthenware.—Professor Wanklyn, F.C.S.: On the Oxidation of β Hexylic Alcohol.—F. A. Abel, F.R.S.: Some results of Experiments on Lucifer Matches and others ignited by Friction.—T. Richardson, Ph.D.: On the presence of a Salt of Baryta in Colliery Water.—George Gore, Birmingham: On a New Gas Furnace for Scientific and Practical Purposes.—H. B. Condy, F.C.S., Battersea: On Disinfectants.—Report of the Committee on Gun Cotton.—Papers on Local Manufactures. J. C. Stevenson, R.C., Clapham, and T. Richardson: Chemical Manufactures.—J. Pattinson: On the various kinds of Pyrites used on the Tyne and neighbourhood for the Manufacture of Sulphuric Acid.—Professor Wanklyn: On Fractional Distillation.—Dr.

Matthiessen, and G. C. Foster: On the Constitution and Rational Formula of Narcotine.—I. L. Bell, T. Sopwith, Dr. Richardson, and T. Spencer: Report on the Metallurgy of the District.—Dr. Riley: On Titanium in Iron.—J. Pattinson: On Deposit in Blast Furnaces.—J. Pattinson: On Zinc, Nickel, and Cobalt in Cleveland Ironstone.—I. L. Bell: On Aluminium.—Dr. Matthiessen: Report on the Chemical Nature of Alloys.—Dr. Richardson: On the Separation of Lead and Antimony.—W. Baker: On the Impurities contained in Lead and their influence on its Technical Uses.—W. Crookes: On Thallium.—I. L. Bell: On Thallium.—Dr. Stevenson Macadam: On the Analysis of Chinese Iron.—Dr. Davey: On the Slaking of Quicklime.—Dr. Zenner: On Impurities in Lead.—L. Kessler: Sur les procédés de Gravure du Verre à l'aide de l'acide fluor-hydrique par impression de la réserve.—L. Kessler: Sur des appareils nouveaux évaporant à multiple effet et à air libre nommés *Evorateurs*.—L. Kessler: Sur les avantages commerciaux d'un nouveau sel de soude cristallisé.—Duncan C. Dallas: On Photelectric Engraving and Observations upon Sundry Processes of Photographic Engraving.—H. Kilgour: Abstract of Paper—Are Nitrogen and Carbonic Oxide the Oxide of Carbon in different Allotropic or Isomeric States?—R. C. Clapham and J. Daglish: On the Minerals and Salts found in Coal Pits.—Dr. Richardson: Researches on the Manufacture of Prussiate of Potash by the late John Lee and T. Richardson.—M. l'Abbé Moigno: Short Communications on Galvanic Copper, Photo-lithography, and Photo-microscopic specimens.—M. Geo. Ville: Définer par la végétation, l'état moléculaire des corps. Analyser la force végétale par des essais raisonnés de culture.—Alphonse Gages: Report on Synthetic Researches on the Formation of Minerals.—Dr. F. L. Phipson: On a New Method of Measuring the Chemical Action of the Sun's Rays.—Dr. F. L. Phipson: On Musical Sounds produced by Carbon. Dr. Murray Thompson: On New Zealand Lignites.—Dr. Otto Richter: On the Chemical and Physical Principles in connection with the Specific Gravity of Liquid and Solid Substances.—W. Symons exhibited a new form of Gas Battery.—Dr. T. Wood: On Oxidation by Ozone.—Dr. S. Macadam: On the Manufacture of Superphosphates and Dissolved Bones.—Dr. B. H. Paul: Recent Applications of the Hydrocarbons derived from Artificial and Natural Sources.—Dr. Richardson and T. W. Bunning: On the Uses of Fuel in Marine Boilers.

THE DEMAND AND SUPPLY OF PHARMACEUTICAL PREPARATIONS.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Gentlemen,—On perusing a letter in this month's Journal from "A Subscriber," Durham, I venture to offer a few remarks on the important subject of "demand and supply of pharmaceutical preparations."

Your correspondent entertains certain views on the subject which will not appear very encouraging in the eyes of those pharmaceutists desirous of commencing business in a limited neighbourhood. He anticipates that for an establishment commenced in even a respectably-sized provincial town for the practice of "pure pharmacy," in a twelvemonth a very gloomy prospect may be expected; and for what reason? because the proprietor is offering what he knows to be a reliable preparation for the benefit of his customer and for the sake of his own reputation.

Now, having had tolerable experience both in town and country, I may be allowed to state that the demand for medicines and pharmaceutical preparations of acknowledged purity in small provincial towns is quite as certain (if not so great) as in more crowded neighbourhoods, or London. It may not be at all times convenient, nor yet profitable, for the provincial chemist to make his own preparations; but have we not houses in the trade of undoubted reputation that possess both the convenience and means for making them carefully and honestly as well as on a large and profitable scale, thereby enabling the pharmaceutist in thinly populated districts to compete creditably with others in more crowded neighbourhoods?

Therefore, in opening a business in either a thickly or thinly populated dis-

trict, and whether mixed or otherwise, the success of it is most likely to depend upon its mainspring being carefully attended to, viz. to supply medicines and preparations of a genuine kind in preference to those of a doubtful character.

I remain, Gentlemen, yours faithfully,

Windermere, September, 1863. A MAJOR ASSOCIATE.

ON THE MOLECULAR MOBILITY OF GASES.

BY THOMAS GRAHAM, F.R.S., MASTER OF THE MINT.

The molecular mobility of gases is here considered in reference chiefly to the passage of gases, under pressure, through a thin porous plate or septum, and to the partial separation of mixed gases which can be effected, as will be shown, by such means. The investigation arose out of a renewed and somewhat protracted inquiry regarding the diffusion of gases (depending upon the same molecular mobility), and has afforded certain new results which may prove to be of interest in a theoretical as well as in a practical point of view.

In the diffusiometer, as first constructed, a plain cylindrical glass tube, rather less than an inch in diameter and about ten inches in length, was simply closed at one end by a porous plate of plaster of Paris, about one-third of an inch in thickness, and thus converted into a gas receiver.* A superior material for the porous plate is now found in the artificially compressed graphite of Mr. Brockedon, of the quality used for making writing-pencils. This material is sold in London in small cubic masses about two inches square. A cube may easily be cut into slices of a millimetre or two in thickness by means of a saw of steel spring. By rubbing the surface of the slice without wetting it upon a flat sandstone, the thickness may be further reduced to about one-half of a millimetre. A circular disk of this graphite, which is like a wafer in thickness, but possesses considerable tenacity, is attached by resinous cement to one end of the glass tube above described, so as to close it and form a diffusiometer. The tube is filled with hydrogen gas over a mercurial trough, the porosity of the graphite plate being counteracted for the time by covering it tightly with a thin sheet of gutta-percha. On afterwards removing the latter, gaseous diffusion immediately takes place through the pores of the graphite. The whole hydrogen will leave the tube in forty minutes or an hour, and is replaced by a much smaller proportion of atmospheric air (about one-fourth), as is to be expected from the law of the diffusion of gases. During the process, the mercury will rise in the tube, if allowed, forming a column of several inches in height,—a fact which illustrates strikingly the intensity of the force with which the interpenetration of different gases is effected. The native or mineral graphite is of a lamellar structure, and appears to have little or no porosity. It cannot be substituted for the artificial graphite as a diffusion-septum. Unglazed earthenware comes next in value to graphite for this purpose.

The pores of artificial graphite appear to be really so minute, that a gas *in mass* cannot penetrate the plate at all. It seems to be molecules only which can pass; and these may be supposed to pass wholly unimpeded by friction, for the smallest pores that can be imagined to exist in the graphite must be tunnels in magnitude to the ultimate atoms of a gaseous body. The sole motive agency appears to be that intestine movement of molecules which is now generally recognized as an essential property of the gaseous condition of matter.

According to the physical hypothesis now generally received,† a gas is represented as consisting of solid and perfectly elastic spherical particles or atoms, which move in all directions, and are animated with different degrees of velocity in different gases. Con-

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* "On the Law of the Diffusion of Gases," Transactions of the Royal Society of Edinburgh, vol. xii. p. 222; or, 'Philosophical Magazine,' 1834, vol. ii. pp. 175, 169, 351.

† D. Bernoulli, J. Herapath, Joule, Krönig, Clausius, Clerk Maxwell, and Cazin. The merit of reviving this hypothesis and first applying it to the facts of gaseous diffusion, is fairly due to Mr. Herapath. See 'Mathematical Physics,' in two volumes, by John Herapath, Esq. (1847).

fined in a vessel, the moving particles are constantly impinging against its sides and occasionally against each other, and such collisions take place without any loss of motion, owing to the perfect elasticity of the particles. Now if the containing vessel be porous, like a diffusiometer, then gas is projected through the open channels, by the atomic motion described, and escapes. Simultaneously the external air or gas, whatever it may be, is carried inwards in the same manner, and takes the place of the gas which leaves the vessel. To the same atomic or molecular movement is due the elastic force, with the power to resist compression, possessed by gases. The molecular movement is accelerated by heat and retarded by cold, the tension of the gas being increased in the first instance and diminished in the second. Even when the same gas is present both within and without the vessel, and is therefore in contact with both sides of the porous plate, the movement is sustained without abatement—molecules continuing to enter and leave in eqnal number, although nothing of the kind is indicated by change of volume or otherwise. If the gases in communication be different, but possess sensibly the same specific gravity and molecnlar velocity, as nitrogen and carbonic oxide do, an interchange of molecnles also takes place without any change in volume. With gases opposed of unequal density and molecular velocity, the amount of penetration ceases of course to be equal in both directions.

These observations are preliminary to the consideration of the passage through a graphite plate, in one direction only, of gas under pressnre, or under the inflnence of its own elastic force. It is to be supposed that a vacuum is maintained on one side of the porous septum, and that air or some other gas, under a constant pressure, is in contact with the other side. Now a gas may pass into a vacuum in three different modes, or in two modes besides that immediately before us.

1. The gas may enter the vacuum by passing through a minute aperture in a thin plate, such as a puncture in platinum foil made by a fine steel point. The rate of passage of different gases is then regulated by their specific gravities, according to a pneumatic law which was deduced by Professor John Robinson from Torricelli's well-known theorem of the velocity of efflux of fluids. A gas rushes into a vacuum with the velocity which a heavy body would acquire by falling from the height of an atmosphere composed of the gas in question, and snpposed to be of uniform density throughout. The height of the uniform atmosphere will be inversely as the specific gravity of the gas; the atmosphere of hydrogen, for instance, sixteen times higher than that of oxygen. But as the velocity acquired by a heavy body in falling is not directly as the height, but as the square root of the height, the rate of flow of different gases into a vacuum will be inversely as the sqnare root of their respective densities. The velocity of oxygen being 1, that of hydrogen will be 4, the square root of 16. This law has been experimentally verified.* The times of the effusion of gases, as I have spoken of it, are similar to those of the law of molecular diffusion; but it is important to observe that the phenomena of effusion and diffusion are distinct and essentially different in their nature. The effusion movement affects masses of gas, the diffusion movement affects molecules; and a gas is usually carried by the former kind of impulse with a velocity many thousand times greater than by the latter. The effusion velocity of air is the same as the velocity of sound.

2. If the aperture of efflux be in a plate of increased thickness, and so becomes a tube, the effusion-rates of gases are disturbed. The rates of flow of different gases, however, assume again a constant ratio to each other when the capillary tube is considerably elongated, when the length exceeds the diameter at least 4000 times. These new proportions of efflux are the rates of the "Capillary Transpiration of Gases."† The rates were found to be the same in a capillary tube composed of copper as they are in a tnbe of glass, and appear to be independent of the material of the capillary. A film of gas no doubt adheres to the inner surface of the tube, and the friction is really that of gas upon gas, and is consequently unaffected by the nature of the tube-snbstance. The rates of transpiration are not governed by specific gravity, and are indeed singularly unlike the rates of effusion.

With respect to the different states of gas, liquid, and solid, it may be observed that there is no incompatibility with each other in these physical conditions. They are often found together in the same substance. The liquid and the solid conditions supervene

* "On the Motion of Gases," Phil. Trans. 1846, p. 573.

† Phil. Trans. 1846, p. 591 and 1849, p. 349.

upon the gaseous condition rather than supersede it. Gay-Lussac made the remarkable observation that the vapours emitted by ice and water, both at 0° C., are of exactly equal tension. The passage from the liquid to the solid state is not made apparent in the volatility of water. The liquid and solid conditions do not appear as the extinction or suppression of the gaseous condition, but something *superadded* to that condition. The three conditions (or constitutions) probably always coexist in every liquid or solid substance, but one predominates over the others. In the general properties of matter we have, indeed, to include still further (1) the remarkable loss of elasticity in vapours under great pressure, which is distinguished by Mr. Faraday as the Caignard-Latour state, or constitution, which intervenes between the liquid and crystalline states, extending into both and affecting probably all kinds of solid and liquid matter in a greater or less degree. The predominance of a certain physical state in a substance appears to be a distinction of a kind with those distinctions recognized in natural history as being produced by unequal development. Liquefaction or solidification may therefore not involve the suppression of either the atomic or the molecular movement, but only the restriction of its range. The hypothesis of atomic movement has been elsewhere assumed, irrespective of the gaseous condition, and is applied by Dr. Williamson to the elucidation of a remarkable class of chemical reactions which have their seat in a mixed liquid.

Lastly, molecular or diffusive mobility has an obvious bearing upon the communication of heat to gases by contact with liquid or solid surfaces. The impact of the gaseous molecule upon a surface possessing a different temperature, appears to be the condition for the transference of heat, or the heat movement, from one to the other. The more rapid the molecular movement of the gas the more frequent the contact, with consequent communication of heat. Hence, probably the great cooling power of hydrogen gas as compared with air or oxygen. The gases named have the same specific heat for equal volumes; but a hot object placed in hydrogen is really *touched* 3·8 times more frequently than it would be if placed in air, and 4 times more frequently than it would be if placed in an atmosphere of oxygen gas. Dalton had already ascribed this peculiarity of hydrogen to the high "mobility" of that gas. The same molecular property of hydrogen recommends the application of that gas in the air-engine, where the object is to alternately heat and cool a confined volume of gas with rapidity.

The transpiration-velocity of oxygen being 1, that of chlorine is 1·5; that of hydrogen 2·26; of ether vapour at low temperatures the same, or nearly the same, number as hydrogen; of nitrogen and carbonic oxide half the velocity of hydrogen; of olefiant gas, ammonia, and cyanogen 2 (double or nearly double that of oxygen); of carbonic acid 1·376, and of the gases of marshes 1·815. In the same gas the transpirability of equal volumes increases with density, whether occasioned by cold or pressure. The transpiration-ratios of gas appear to be in constant relation with no other known property of the same gases, and they form a class of phenomena remarkably isolated from all else at present known of gases.

There is one property of transpiration immediately bearing upon the penetration of the graphite plate by gases. The capillary offers to the passage of gas a resistance analogous to that of friction, proportional to the surface, and consequently increasing as the tube or tubes are multiplied in number and diminished in diameter, with the area of discharge preserved constant. The resistance to the passage of a liquid through a capillary was observed by Poiseuille to be nearly as the fourth power of the diameter of the tube. In gases the resistance also rapidly increases; but in what ratio, has not been observed. The consequence, however, is certain, that as the diameter of the capillaries may be diminished beyond any assignable limit, so the flow may be retarded indefinitely, and caused at last to become too small to be sensible. We may therefore have a mass of capillaries of which the passages form a large aggregate, but which are individually too small to permit a sensible flow of gas under pressure. A porous solid mass may possess the same reduced penetrability as the congeries of capillary tubes. Indeed, the state of porosity described appears to be more or less closely approached by all loosely aggregated mineral masses, such as lime plaster, stucco, chalk, baked clay, non-crystalline earthy powders like hydrate of lime or magnesia compacted by pressure, and in the highest degree perhaps by artificial graphite.

3. A plate of artificial graphite, although it appears to be practically impenetrable to gas by either of the two modes of passage previously described, is readily penetrated by the agency of the molecular or diffusive movement of gases. This appears on com-

paring the time required for the passage of equal volumes of different gases under a constant pressure. Of the following three gases, oxygen, hydrogen, and carbonic acid, the time required for the passage of an equal volume of each through a capillary glass tube, in similar circumstances as to pressure and temperature, was formerly observed to be as follows:—

	Time of capillary transpiration.
Oxygen	1
Carbonic acid	0·72
Hydrogen	0·44

Through a plate of graphite, of half a millimetre in thickness, the same gases were now observed to pass, under a constant pressure of a column of mercury of 100 millimetres in height, in times which are as follows:—

	Time of molecular passage.	Square root of density (oxygen 1).
Oxygen	1	1
Hydrogen	0·2472	0·2502
Carbonic acid	1·1886	1·1760

It appears then that the times of passage through the graphite plate have no relation to the capillary transpiration-times of the same gases first quoted above. The new times in question, however, show a close relation to the square roots of the densities of the respective gases, as is seen in the last table; and so far they agree with theoretical *times of diffusion* usually ascribed to the same gases.

The experiments were varied by causing the gases to pass into a Torricellian vacuum, and consequently under the full pressure of the atmosphere. The times of penetration of equal volumes of gases were now—

	Times.	$\sqrt{\text{Density}}$.
Oxygen	1	1
Air	0·9501	0·9507
Carbonic acid	1·1860	1·1760
Hydrogen	0·2505	0·2502

This penetration of the graphite plate by gases appears to be entirely due to their own proper molecular motion, quite unaided by transpiration. It seems to offer the simplest possible exhibition of the molecular or diffusive movement. This pure result is to be ascribed to the wonderfully fine porosity of the graphite. The interstitial spaces, or channels, appear to be sufficiently small to extinguish transpiration, or the passage of masses entirely. The graphite becomes a molecular sieve, allowing molecules only to pass through.

With a plate of stucco, the penetration of gases under pressure is very rapid, and the volumes of air and hydrogen passing in equal times are as 1 to 2·891, which is a number for hydrogen intermediate between its transpiration-volume 2·04 and diffusion-volume 3·8, showing that the passage through stucco is a mixed result.

With a plate of biscuitware, 2·2 millimetres in thickness, the volume of hydrogen rose to 3·754 (air = 1), approaching closely to 3·8, the molecular ratio.

The rate of passage of a gas through graphite appeared also to be closely proportional to the pressure.

Further, hydrogen was found to penetrate through a graphite plate into a vacuum, with sensibly the same absolute velocity as it diffused into air, establishing the important fact that the impelling force is the same in both movements. The molecular mobility may therefore be spoken of as the diffusive movement of gases; the passage of gas through a porous plate into vacuum, as diffusion in one direction or single diffusion; and ordinary diffusion, or the passage of two gases in opposite directions, as double, compound, or reciprocal diffusion.

Atmolysis.—A partial separation of mixed gases and vapours of unequal diffusibility can be effected by allowing the mixture to permeate through a graphite plate into a vacuum, as was to be expected from the preceding views. As this method of analysis has a practical character and admits of wide application, it may be convenient to distinguish it by a peculiar name. The amount of the separation is in proportion to the pressure, and attains its maximum when the gases pass into a nearly perfect vacuum. A

variety of experiments were made on this subject, of which perhaps the most interesting were those upon the concentration of the oxygen in atmospheric air. When a portion of air confined in a jar is allowed to penetrate into a vacuum through graphite or unglazed earthenware, the nitrogen should pass more rapidly than the oxygen in the proportion of 1·0668 to 1, and the proportion of oxygen be proportionally increased in the air left behind in the jar. The increase in the oxygen actually observed when the air in the jar was reduced from 1 volume

To 0·5	volume, was		0·48	per cent.
0·25	"	"	0·98	"
0·125	"	"	1·54	"
0·0625	"	"	2·02	"

Or, the oxygen increased from 21 to 23·02 per cent. in the last sixteenth part of air left behind in the jar.

The most remarkable effects of separation are produced by means of the *tube atmolyser*. This is simply a narrow tube of unglazed earthenware, such as a tobacco-pipe stem two feet in length, which is placed within a shorter tube of glass and secured in its position by corks, so as to appear like a Liebig's condenser. The glass tube is placed in communication with an air-pump, and the annular space between the two tubes is maintained as nearly vacuous as possible. Air or any other mixed gas is then allowed to flow in a stream along the clay tube, and collected as it issues. The gas so atmolysed is of course reduced in volume, much gas penetrating through the pores of the clay tube into the air-pump vacuum; and the slower the gas is collected the greater the proportional loss. In the gas collected, the denser constituent of the mixture is thus concentrated in an arithmetical ratio, while the volume of the gas is reduced in a geometrical ratio. In one experiment the proportion of oxygen in the air after traversing the atmolyser was increased to 24·5 per cent., or 16·7 upon 100 oxygen originally present in the air. With gases differing so much in density and diffusibility as oxygen and hydrogen, the separation is of course much more considerable. The explosive mixture of two volumes of hydrogen and one volume of oxygen, gave oxygen containing only 9·3 per cent. of hydrogen, in which a taper burned without explosion; and with equal volumes of oxygen and hydrogen, the proportion of the latter was easily reduced from 50 to 5 per cent.

Interdiffusion of Gases—double diffusion.—The diffusiometer was much improved in construction by Professor Bunsen, from the application of a lever arrangement to raise and depress the tube in the mercurial trough. But the mass of stucco forming the porous plate in his instrument was too voluminous, in my opinion, and, from being dried by heat, had probably detached itself from the walls of the glass tube. The result obtained of 3·4 for hydrogen, air being 1, is, I understand, no longer insisted upon by that illustrious physicist. It is indeed curious that my old experiments generally rather exceeded than fell short of the theoretical number for hydrogen, $\sqrt{\frac{1}{0·06926}} = 3·7997$. With stucco as the material, the cavities in the porous plate form about one-fourth of its bulk, and affects sensibly the ratio in question, according as they are or are not included in the capacity of the instrument. Beginning the diffusion always with these cavities filled with hydrogen, the numbers now obtained with a stucco plate of 12 millims. in thickness, dried without heat, were 3·783, 3·8, and 3·739 when the volume of the cavities of stucco is added to the air and hydrogen, and 3·931, 3.949, and 3·883 when such addition is not made to these volumes. The graphite plate, on the other hand, being thin, and the volume of its pores too minute to require to be taken into account, its action is not attended with the same uncertainty. With a graphite plate of 2 millim. in thickness, the number for hydrogen into air was 3·876, and of hydrogen into oxygen 4·124, instead of 4. With a graphite plate of 1 millim. in thickness, hydrogen gave 3·993 to air 1. With a graphite plate of 0·5 millim. in thickness, the proportional number for hydrogen to air rose to 3·984, 4·068, and 4·067. A similar departure from the theoretical number was observed when hydrogen was diffused into oxygen or carbonic acid, instead of air. All these experiments were made over mercury and with dried gases. It appears that the numbers are most in accordance with theory when the graphite plate is thick, and the diffusion slow in consequence. If the diffusion be very rapid, as it is with the thin plates, something like a current is possibly formed in the channels of the graphite, taking the direction of the hydrogen and carrying back in mass a little air, or the slower gas,

whatever it may be. I cannot account otherwise for the slight predominance which the lighter and faster gas appears always to acquire in diffusing through the porous septum.

Speculative Ideas respecting the Constitution of Matter.

It is conceivable that the various kinds of matter, now recognised as different elementary substances, may possess one and the same ultimate or atomic molecule existing in different conditions of movement. The essential unity of matter is an hypothesis in harmony with the equal action of gravity upon all bodies. We know the anxiety with which this point was investigated by Newton, and the care he took to ascertain that every kind of substance, "metals, stones, woods, grain, salts, animal substances," etc., are similarly accelerated in falling, and are therefore equally heavy.

In the condition of gas, matter is deprived of numerous and varying properties with which it appears invested when in the form of a liquid or solid. The gas exhibits only a few grand and simple features. These again may all be dependent upon atomic and molecular mobility. Let us imagine one kind of substance only to exist, ponderable matter; and further, that matter is divisible into ultimate atoms, uniform in size and weight. We shall have one substance and a common atom. With the atom at rest the uniformity of matter would be perfect. But the atom possesses always more or less motion, due, it must be assumed, to a primordial impulse. This motion gives rise to volume. The more rapid the movement the greater the space occupied by the atom, somewhat as the orbit of a planet widens with the degree of projectile velocity. Matter is thus made to differ only in being lighter or denser matter. The specific motion of an atom being inalienable, light matter is no longer convertible into heavy matter. In short, matter of different density forms different substances,—different inconvertible elements, as they have been considered.

What has already been said is not meant to apply to the gaseous volumes which we have occasion to measure and practically deal with, but to a lower order of molecules or atoms. The combining atoms hitherto spoken of are therefore not the molecules of which the movement is sensibly affected by heat, with gaseous expansion as the result. The gaseous molecule must itself be viewed as composed of a group or system of the preceding inferior atoms, following as a unit laws similar to those which regulate its constituent atoms. We have indeed carried one step backward, and applied to the lower order of atoms, ideas suggested by the gaseous molecule, as views derived from the solar system are extended to the subordinate system of a planet and its satellites. The advance of science may further require an indefinite repetition of such steps of molecular division. The gaseous molecule is then a reproduction of the inferior atom on a higher scale. The molecule or system is reached which is affected by heat, the diffusive molecule of which the movement is the subject of observation and measurement. The diffusive molecules are also to be supposed uniform in weight, but to vary in velocity of movement, in correspondence with their constituent atoms. Accordingly the molecular volumes of different elementary substances have the same relation to each other as the subordinate atomic volumes of the same substances.

But further, these more and less mobile or light and heavy forms of matter have a singular relation connected with equality of volume. Equal volumes of two of them can coalesce together, unite their movement, and form a new atomic group, retaining the whole, the half, or some simple proportion of the original movement and consequent volume. This is chemical combination. It is directly an affair of volume, and only indirectly connected with weight. Combining weights are different, because the densities, atomic and molecular, are different. The volume of combination is uniform, but the fluids measured vary in density. This fixed combining measure—the *metron* of simple substances—weighs 1 for hydrogen, 16 for oxygen, and so on with the other "elements."

To the preceding statements respecting atomic and molecular mobility, it remains to be added that the hypothesis admits of another expression. As in the theory of light we have the alternative hypotheses of emission and undulation, so in molecular mobility the motion may be assumed to reside either in separate atoms and molecules, or in a fluid medium caused to undulate. A special rate of vibration or pulsation originally imparted to a portion of the fluid medium enlivens that portion of matter with an individual existence, and constitutes it a distinct substance or element.

ON THE DESTRUCTION OF NOXIOUS INSECTS BY MEANS OF THE PYRETHRUM.

BY C. WILLEMOT.

Of all substances hitherto proposed for the destruction of noxious insects, powders have been found the only ones that can be used to advantage, on account of their simple and easy method of application. All such powders, too, which have been employed, so far as known, are derived from the vegetable creation. It would occupy too great a space to enumerate here all the plants used in the form of powder for this purpose; it will suffice to mention some which have been more particularly under observation. Among these are the straight-leaved pepperwort (*Lepidium ruderale*, Linn., and *Thlaspi ruderale*, Desfon.), found growing in uncultivated places and among rubbish around Paris. This is used in Southern Dalmatia, in the form of powder, almost exclusively for the destruction of fleas. In some parts of Southern Russia, especially in the Crimea, a plant very common in France, *Aristolochia Clematitis*, Linn. (common birthwort), is used exclusively to destroy bugs. Sawdust of aromatic wood, particularly American cedar (*Cedrela odorata*, Linn.), is largely sold for the destruction of insects, and, according to some authorities, most of the powders sold in Paris for that purpose are composed of that substance. But after using and experimenting with them we have been fully convinced that the object cannot thus be perfectly attained. Their action is feeble, or they merely stupefy for a time the insect, which soon recovers its strength and sensibility to do injury.

The greater number of the plants which furnish the most satisfactory means for the destruction of insects are of the genus *Pyrethrum*. Many observers, considering the botanic resemblance (as well as similar properties of this genus) with kindred ones, as certain chamomiles, the *Anthemis Cotula* for instance, have pretended that such indigenous plants (chamomiles) may specifically furnish a powder for destroying insects equal in every respect to the *Pyrethrum*. But accurate and detailed experiments by ourselves and other competent observers refute such assertion. All the efficacy of the *Anthemis Cotula* consists in rendering the insects insensible for a time instead of destroying them. The inhabitants of the regions of Europe and Asia, near the Caucasian mountains, seem to have been the first to discover the properties of the *Pyrethrum*, and try on a large scale the powders obtained from these plants. The species employed differ according to the different localities.

It is easy to comprehend that the inhabitants of the Caucasus choose for their use that kind which is most abundant in their own country. Thus in Armenia they prefer the red Pyrethrum (*P. roseum*, Biebers.), commonly called "lowizachek," or flea plant.

The Persian powder, which appears most extensively used, is almost wholly composed of the flesh-coloured Pyrethrum (*P. carneum*, Biebers.). Dr. Ch. Koch in his 'Travels in the East' gives very curious details respecting this precious species in the Caucasian regions. In the 'Journal de la Société Impériale et Centrale d'Horticulture de la Seine,' vol. iii., 1857, p. 756, also may be found an analysis of a note by Mr. Neumann, of Breslau, on the "Culture and Preparation of the Powder of the *Pyrethrum carneum*."

We may here remark, in passing, that in countries where the most frequent use has been made of these powders of *Pyrethrum*, they have only been applied to the destruction of those insects which are troublesome in dwellings. Our object has been to select from the different plants the one which presents the greatest range of efficacy; and we have been more exacting in this than heretofore has been the case in seeking a plant of incontestable efficacy for the destruction of insects, and which can be so applied, not only to vermin in the house, but also to those insects which every year commit such great ravages upon the cereals, fruit-trees, leguminous and ornamental plants, etc. A plant was desirable which can easily be acclimatized in France, the properties of which, in its wild state in its native regions, are neither destroyed nor weakened by cultivation, and which can be raised with but slight attention to its culture. We want, finally, a productive plant, to the end that the powder it furnishes may be sold at a very low price. Such a plant we are now fortunate enough to introduce for the public use. Its efficacy has been fully proved by a great number of persons, as will be seen hereafter; its acclimatization is very satisfactorily evinced; its culture is most simple; its properties are wholly retained; the production is very abundant; now nothing remains but its extensive pro-

pagation, which, however, is not without many difficulties. We will not disguise the fact that the great success so far attained by no means makes us suppose the task accomplished, but it nevertheless encourages us to continue our efforts with new perseverance. It was about 1850 when the first powder of Pyrethrum was introduced into France for the destruction of insects in houses. The powder came exclusively from provinces of the Caucasus, of Persia, and Dalmatia. Our researches have proved to us that that from the Caucasus is the best. For a number of years the inhabitants of those countries have successfully used the powder of the Pyrethrum to protect themselves against the ravages of numerous insects.

For a long period, a preparation was used throughout the Russian Caucasus for the destruction of injurious insects, and was regarded as a secret by the rest of the world, until its properties became known to Mr. Jumtikoff, an American merchant, while travelling through that country some forty years ago. He communicated his discovery to his son, who manufactured the article in 1828. This powder, or the plant from which it was obtained, was soon after introduced into Alexandropol, and subsequently the powder got into use in Germany and France, where its popularity is rapidly increasing. At present there are more than twenty villages in the district of Alexandropol engaged in cultivating the plant and collecting its flowers. The plants from which this powder is produced consist of small perennial shrubs, from twelve to fifteen inches in height, bearing flowers an inch and a half in diameter, and resembling those of the ox-eye daisy (*Chrysanthemum Leucanthemum*).

They grow on the mountains of the Caucasus, at an elevation of 5650 feet above the level of the sea, in a temperature of 68° Fahr. They are of easy cultivation in gardens, and since their hardiness has become known they have been introduced into Germany, Holland, and France, for the purposes of ornament, when they begin to flower in June. They will flourish in any ordinary garden soil, and may be propagated by layers as well as by seed.

The parts of the plants from which the powder is made are the dried flower-heads, gathered when ripe, on fine days, and usually dried by exposure to the sun; but they have been found to be more serviceable when dried in the shade, during which operation they are occasionally turned. In the process of desiccation they lose about 90 per cent. When perfectly dried, they are first comminuted with the hand, and then reduced to powder in a small mill.

A quantity of these plants grown upon eighteen square rods is estimated to furnish one hundred pounds of powder, which is best preserved in sealed vessels of glass. The application is made either as a powder or as an infusion, though in the latter form it is more beneficial, especially when intended for the destruction of insects on plants. The powder may be employed directly to the insects themselves, or in the places which they frequent. They are attracted by its smell, become stupefied, and immediately die. This substance may be employed without injury to the larger animals, or to man. It is intimated that the amount of this powder consumed annually in Russia alone is about 500 tons.

The inhabitants of the Caucasus and adjoining countries who used these powders had only a very limited knowledge of their plants, and did not suspect that one among them, the *Pyrethrum Willemoti*, Duchartre, would be called upon to render the most effective service to agriculture and horticulture, achieving the preservation of food, wool, furs, and the comfort of man and the domestic animals, etc.

These powders had been introduced into France for several years before a choice had been made among them, and the special importance of this particular species recognised. The high price, and the numerous adulterations they have undergone, diverted the public from this acquisition, and from a public appreciation of its efficacy. Submitted to a close analysis, these powders, as sold, have been found to be mixed with dangerous substances, which in due regard to public safety require to be vigorously excluded from sale. In them sumac powder is a common ingredient, from its close resemblance to the Pyrethrum powder; and also jalap, cockle of Levant, nux vomica, and even arsenic, enter into the composition of the powders we have examined.

It was not till 1856, and after many efforts, that we could procure some good seeds of the Pyrethrum of the Caucasus. We were then able to extend our researches as to the culture of the plant. We had to proceed cautiously in determining the soil best adapted to it, to find out the best exposure, and to discover the care necessary to be bestowed on

it. The first sown, on September 15, 1856, produced only a few shoots. A great point was to ascertain whether the plant was an annual or perennial. In order to determine this, several of the procured plants passed through the winter of 1856–57, and sustained from 8 to 12 degrees of cold without appearing to suffer.

The seeds gathered from this first culture were sown in February, 1858. In May, we communicated our experiments, and the success that had crowned them, to Messrs. Decaisne, Neumann, and Pepin. These gentlemen then examined the plant botanically, and their opinions are as follows:—(Here follows a botanical description of the genus *Pyrethrum*, and of the particular plant just referred to, from which it appears that the present species has not hitherto been described; hence M. Duchartre has named it *Pyrethrum Willemoti.*)

Culture and Gathering.—The Pyrethrum, though a native of the Caucasus, where it grows abundantly and at a slight elevation above the level of the sea, under a latitude warmer than that of Paris, succeeds very well on good soil in France. It is very hardy, and can sustain without hazard the severe winter there. A few years' experience has taught the writer that it is little sensible to cold, and that it needs no shelter during the winter. It has been asserted that the kindred species which also grow in the Caucasus have rather suffered than benefited by the shelter given to them. The soil best adapted to the culture of the plant is a pure earth somewhat siliceous and dry. Moisture and the presence of dung is injurious, the plant being extremely sensitive to a mass of water, and would in such case immediately perish. A southern aspect is the most favourable. The best time for putting the seed in the ground is from March to April. It can be done even in the month of February if the weather will permit it. After the soil has been prepared and the seeds are sown, they are covered by a stratum of soil mixed with some vegetable mould, and the roller is slightly applied to it. Every five or six days the watering is to be renewed in order to facilitate the germination.

At the end of about thirty or forty days the young plants make their appearance, and as soon as they have gained strength enough they are transplanted. Three months after they are transplanted again at wider distances, according to their strength, each time being of course watered, but only moderately.

The blossoming commences in the second year towards the end of May, and continues to the end of September. Within that period the heads from which the powder is made must be gathered. The most favourable time for gathering seems to be when the heads are about to open,—that is, when the florets of the circumference are yet standing erect. In this state the fecundation takes place, and the essential oil contained in the heads has reached its highest state of development. The stalks and leaves, through having the properties in a less degree, may be used also for making powder, but they must be mixed with the flowers in the proportion of a third of their weight. The powder thus obtained will perfectly answer the destruction of insects. Towards the end of September, at which time the blossoming has ceased, the stalks are cut at about four inches from the ground. As the flowers are cut they are dried in a granary or shed, great care, however, being taken not to expose them to moisture or to the rays of the sun. When completely dried the flowers are to be hermetically closed up in sacks, so as to prevent too early pulverization. In pulverizing them it is better not to take a larger quantity than the wants of the moment may require. The volatilization, which is of course more rapid in the powdered form than in flowers, will thus be avoided. It has been suggested that the drying of the flowers for making the powder might be effected on sheet-iron plates, like tea-leaves are dried in China, but this operation is most injurious to the plant, dissipating the essential oil.

Pulverization.—Among the numerous methods which we have tried in order to simplify the pulverization of the dried flowers, that which appears the best is to pound the flowers in a mortar. The mortar should be covered with a piece of leather, through which the pestle moves, adjusting it in such a way as to prevent any contact from without, as is usually done in pulverizing drugs in a laboratory. The quantity to be pulverized should not exceed a pound at a time, thus avoiding too high a degree of heat, which would be injurious to the quality of the powder. The pulverization being deemed sufficient, the substance is sifted through a silk sieve, and the residue, with a new addition of flowers, is put into the mortar and pulverized again.

This method of preparation is so simple as to be within the reach of all; the pulverization by steam is more rapid and effectual, but necessarily more expensive. The best

receptacles for holding the powder seem to be bottles; these, if well corked, will keep out moisture, which is so injurious to the properties of the powder. If the powder is not to be kept long, small boxes will do as well as bottles.

Insects destroyed by the Powder.—The principal insects to which the powder is destructive may be ranged under four classes:—first, insects injurious to agriculture and horticulture; second, insects obnoxious to man and his habitation; third, insects destructive to certain substances, as wool, furs, feathers; and, fourth, insects injurious to museums of animal and vegetable products, and collections of natural history. We do not pretend to enumerate all the insects to which the powder is destructive; it will suffice to mention a few instances, which will sufficiently show what applications may be made of it. Our domestic animals,—dogs, cats, fowls, pigeons, etc.,—are subject to annoyance from insects which cannot withstand the effects of this powder. Of the numerous insects injurious to agriculture and horticulture we may mention the following which have been destroyed by it:—the weevil, bark-beetle, wheat-fly, maggots, cocci, aphides, earwigs, spiders, ants, etc. It is evident that not only the perfectly developed insects are destroyed, but also the larvæ, which in some cases do greater injury than the insects themselves. Large depôts where military stores or navy supplies are kept, and especially extensive bakeries, may use the powder with great advantage for the destruction of weevils, midges, crickets, cockroaches, etc., the great plague of those establishments. The powder is equally efficacious in destroying insects which are a constant source of annoyance to the inhabitants of cities and the country. Gnats and mosquitoes are banished; bugs, fleas, and flies disappear from houses under its influence. As to manufactured articles, the powder is applied effectually to the following:—

1. Furs.—These require great care for their preservation. Numerous insects live upon them. Their propagation is rapid. The only remedy against their ravages hitherto has been pepper or camphor, but by using the powder of Pyrethrum the insects and their larvæ will be most effectually destroyed.

2. Feathers.—The same result will be arrived at by using this powder for the preservation of the costly products of feather dealers. Most woollen products have also a number of insect enemies, especially in their undeveloped state, as larvæ. The powder of Pyrethrum, if applied in proper time, will effectually preserve all woollen articles. Natural history, too, has its share of the advantages afforded by this powder in the preservation of collections of mammalia, birds, fishes, reptiles, insects, and anatomical preparations.

Herbariums are very frequently devastated by insects gradually piercing the paper well as the dried plants, reducing the latter almost to powder, more especially if they have not been poisoned by chloride of mercury dissolved in alcohol—a substance both expensive and dangerous. By applying a pinch of the powder between the leaves of his herbarium, the botanist will soon get rid of the enemies of his collection. Finally, a most important advantage of this powder is that it is innocuous to man, and can be absorbed by the human subject without the slightest danger to his health. Some physicians of celebrity even assert that the powder can be advantageously sprinkled upon sores or open wounds that diffuse an unpleasant odour.

Mode of applying the Powder.—In using the powder it must be applied carefully and in sufficient quantity, otherwise the result will be unsatisfactory, especially if used against some of the hardy or very resisting species of insects. Occasionally the powder, by being exposed to the air or moisture, will have lost its destructive properties, so as to render the result doubtful and wholly inefficient; at others the result has been unsatisfactory, because the most favourable moment for the operation has been overlooked. A rainy or wet day, for instance, always lessens the destructive efficacy, because the powder, containing a very volatile essential oil, renders the conservation of this principle extremely difficult.

Of all the methods for applying the powder to plants attacked by insects, including the vine, the bellows will best accomplish the object. As there is only a small quantity of powder thrown at once, the loss will be very small, whilst in any other way a good deal of it will fall upon the ground. The powder should be directly applied to the parts operated on, and with care and precaution it may be made to penetrate into the most inaccessible parts of a plant. If, for instance, a plant has been attacked by plant lice, which are often hidden or masked by thick foliage, it will become necessary to turn aside this foliage, so as to have the insects exposed, and the powder directly brought into contact with them.

In all cases these operations should take place on a warm day, the morning being always preferable. A slight moisture arising from the morning dew will make the powder more easily adhere to the spots where it is applied, and maintain its properties long enough to cause the death of the insects. The insufflation should be renewed several times according to the nature and number of insects to be destroyed. The first operation generally stupefies them, while at the second or third application they lose their strength, fall to the ground, and die sooner or later.

In order to prevent the ravages of the wheat-midge, the powder is mixed with the grain to be sown, in the proportion of about two ounces to two or three bushels, which will save a year's crop.

For insects in dwellings the insufflation may be performed by bellows of a smaller size than those used in agriculture and horticulture. Proper care should be taken to make the powder penetrate to the recesses where the insects lodge. Household furniture ought to be scrupulously searched, and bedsteads and sofas sprinkled in the evening. By continuing this for several days, the premises will be thoroughly rid of insects.

For the preservation of furs, woollen garments, or patterns, it is necessary, at the approach of spring, to sprinkle the articles abundantly with the powder, the object in contemplation being, not the destruction of the insects, but the preventing their reappearance.—*From the Technologist.*

ON THE MOLECULE OF WATER.

BY WILLIAM ODLING, ESQ., M.B., F.R.S.

(*Read at a meeting of the Royal Institution of Great Britain, Friday, May* 15, 1863.)

Does the molecule of water consist of a single combining proportion of hydrogen having the relative weight 1, united with a single combining proportion of oxygen having the relative weight 8, or does it consist of two combining proportions of hydrogen having each the relative weight 1, united with a single combining proportion of oxygen having the relative weight 16? In other words, ought the molecule of water to be represented by the formula HO', in which O' stands for 8 parts by weight of oxygen, or by the formula H_2O'', in which O'' stands for 16 parts by weight of oxygen? The question is entirely one of fact. If the hydrogen of water is experimentally indivisible, it necessarily constitutes an indivisible proportion, or atomic proportion, or so-called atom. If, on the other hand, it is experimentally divisible into two equal parts, it must consist of at least two atomic proportions, or two atoms.

Similar questions with regard to the molecular formulæ of other compounds have been decided with an almost absolute unanimity. Thus chlorhydric or muriatic acid gas consists of 1 part by weight of hydrogen united with 35·5 parts by weight of chlorine, and its molecule is represented by the formula HCl, in which H stands for a single combining proportion of hydrogen, and Cl for a single combining proportion of chlorine, having 35½ times the weight of the single combining proportion of hydrogen.

Phosphoretted hydrogen gas consists of 1 part by weight of hydrogen united with 10·3 parts by weight of phosphorus. Its molecule, however, is not represented by the formula HP', in which H stands for a single combining proportion of hydrogen having the relative weight 1, and P' for a single combining proportion of phosphorus having the relative weight 10·3; but by the formula H_3P''', in which H_3 stands for three separable proportions of hydrogen having each the relative weight 1, and P''' for a single indivisible proportion of phosphorus having the relative weight 31.

Silicated hydrogen gas consists of 1 part by weight of hydrogen united with 7 parts by weight of silicon. Its molecule, however, is not represented by the formula HSi', in which Si' stands for 7 parts of silicon; or yet by the formula H_3Si''', in which Si''' stands for 21 parts of silicon, as the resemblance in properties between silicated and phosphoretted hydrogen might seem to require; but by the formula H_4Si'''', in which H_4 stands for four separable proportions of hydrogen having each the relative weight 1, while Si'''' stands for a single indivisible proportion of silicon having the relative weight 28.

Why then do chemists represent chlorhydric acid, and its prototype fluorhydric acid, as each containing one combining proportion of hydrogen; phosphoretted hydrogen, and its prototype ammonia, as each containing three combining proportions of hydrogen; and

silicated hydrogen, and its prototype marsh-gas, as each containing four combining proportions of hydrogen? For all are agreed that in the molecules of fluorhydric acid and chlorhydric acid there is one part of hydrogen united with 19 parts of fluorine, and 35·5 parts of chlorine respectively; that in the molecules of ammonia and phosphoretted hydrogen there are three parts of hydrogen, united with 14 parts of nitrogen and 31 parts of phosphorus respectively; and that in the molecules of marsh-gas and silicated hydrogen there are four parts of hydrogen, united with 12 parts of carbon and 28 parts of silicon respectively.

The reasons by which chemists are induced to be so seemingly inconsequent are very numerous, and some of them very recondite; but the reason of greatest weight and most obvious character is drawn from the phenomena of substitution; by which is meant the change effected in the composition of various bodies, by the abstraction of certain of their constituent elements, and the introduction of certain other elements or groupings in their stead. Thus we have sodium-alcohol, in which a portion of the hydrogen of common alcohol is substituted by its equivalent of sodium; bromaniline, in which a portion of the hydrogen of common aniline is substituted by its equivalent of bromine; nitrophenol, in which a portion of the hydrogen of common phenol is substituted by its equivalent of peroxide of nitrogen; and so in very many other instances. Now the conclusions deducible from the phenomena of substitution, whether elementary or compound, direct or indirect, obvious or latent, are, as will presently appear, of the greatest importance in determining the molecular formulæ of compound bodies.

It is evident, for instance, that the molecule of marsh-gas must contain four proportions of hydrogen, because we are able to replace $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$, and $\frac{4}{4}$ of its hydrogen by four successive substitutions, to produce a series of bodies differing from one another by a regular gradation of properties. Thus the final product of the action of chlorine upon marsh-gas is a compound in which all the hydrogen of marsh-gas is replaced by its equivalent of chlorine; so that if we consider the molecule of marsh-gas to consist of one combining proportion of hydrogen united with 3 parts by weight of carbon, then the molecule of its chloro-derivative will consist of one combining proportion of chlorine united with 3 parts by weight of carbon; or if we represent the molecule of marsh-gas to consist of four combining proportions of hydrogen united with 12 parts by weight of carbon, then the molecule of its chloro-derivative must consist of four combining proportions of chlorine united with 12 parts by weight of carbon; as shown in the following table:—

$C' = 3$		$C'''' = 12$	
(3)	$H\,C'$	$H_4\,C''''$	(12)
(12)	$3H\,C'.\ Cl\,C'$	$Cl\,H_3\,C''''$	(12)
(6)	$H\,C'.\ Cl\,C'$	$Cl_2\,H_2\,C''''$	(12)
(12)	$H\,C'.\,3Cl\,C'$	$Cl_3\,H\,C''''$	(12)
(3)	$Cl\,C'$	$Cl_4\,C''''$	(12)

Now exactly intermediate between the original hydride and the final chloride is a body which contains hydrogen and chlorine in equivalent proportions, and which consequently cannot be represented with less than 6 parts by weight of carbon, and may of course be represented with 12 parts; while intermediate between this body and marsh-gas on the one hand, and between it and chloride of carbon on the other, are two additional compounds, the one containing three combining proportions of hydrogen and one combining proportion of chlorine, the other containing three combining proportions of chlorine and one combining proportion of hydrogen, and both of them consequently incapable of being represented with less than 12 parts by weight of carbon. There are thus two sets of formulæ presented for selection; the one representing the above-mentioned compounds with unequal quantities of carbon by the simplest possible individual formulæ, the other representing them with an equal quantity of constituent carbon by the simplest possible series of formulæ; and a little consideration has led chemists to the unanimous opinion that the formulæ in the second column do, while those in the first column do not, express the actual correlations of the bodies represented. For these bodies manifest in every respect a regular seriation of properties, such as necessarily would be the case if their molecules differed from one another only by a gradually increasing substitution of chlorine for hydrogen; but such as could not be the case if the constituent carbon of their

respective molecules varied in the ratio of 3 to 12, or even of 3 to 6. Moreover, by adopting the formula H_4C'''' for marsh-gas we perceive at once why in its chloro-derivatives the hydrogen and chlorine should always stand to one another in the relation of fourths But if marsh-gas is to be represented by the formula HC', and its chloro-derivatives regarded as compounds of HC' with ClC', there is no reason why we should not have compounds of $1HC'$ with 2 or 5, or 6 of ClC', or of $2HC'$ with $3ClC'$, etc., in which the hydrogen would stand to the chlorine in the relation of a third, or of two-thirds, or of a fifth, or of a sixth, etc. But with the tetrahydric model, corresponding to the formula H_4C'''', and represented below, the successive displacement of the hydrogen of marsh-gas in fourths, and in no other proportion, becomes perfectly intelligible, thus:—



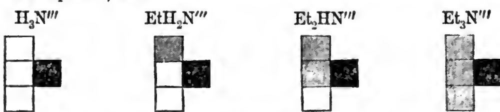
By the action of chlorine upon marsh-gas, there are produced in succession monochloromethene, in which one-fourth of the hydrogen is displaced by chlorine; then dichloromethene, in which two-fourths of the hydrogen are displaced by chlorine; then trichloromethene or chloroform, in which three-fourths of the hydrogen are displaced by chlorine; and lastly, tetrachloromethene, in which all four-fourths of the hydrogen are displaced by chlorine. If, then, we take one relative part of hydrogen as the least indivisible proportion of hydrogen that can enter into a combination, it is evident that the molecule of marsh-gas must contain four such parts, or four combining proportions, or, in common parlance, four atoms of hydrogen.

The case of ammonia is even more striking than that of marsh-gas. When we effect the substitution of some element or grouping for the hydrogen of ammonia, the substituted and remaining hydrogen are not related to one another in fourths, as happens with marsh-gas, but always in thirds. When, for instance, potassium is heated in ammonia, there is produced the compound known as potassamide, which consists of one combining proportion of potassium, and two combining proportions of hydrogen—one-third of potassium and two-thirds of hydrogen—united with fourteen parts by weight of nitrogen. Again, when ammonia is acted on by iodine, there is produced the very explosive body known as diniodamide, which consists of two combining proportions of iodine and one combining proportion of hydrogen—two-thirds of iodine and one-third of hydrogen—united with fourteen parts by weight of nitrogen; while if we act upon ammonia by excess of chlorine, we obtain the highly dangerous compound known as trichloramide or chloride of nitrogen, in which all the hydrogen of ammonia is replaced by chlorine. But the most satisfactory evidence of the trihydric character of ammonia is afforded by Hofmann's experiments on the volatile organic bases, in which he succeeded in replacing one-third, two-thirds, and three-thirds of the hydrogen of ammonia by one and the same radicle, and by a continuation of one and the same process; thus:—

$N' = 4{\cdot}7$			$N''' = 14.$	
(4·7)	HN'		H_3N'''	(14)
(14)	$2\,HN'.\ Et\,N'$		$Et\ H_2N'''$	(14)
(14)	$HN'.\ 2\,Et\,N'$		$Et_2\,H\,N'''$	(14)
(4·7)	$Et\,N'$		$Et_3\,N'''$	(14)

The composition of ethylamine and diethylamine cannot possibly be expressed with less than fourteen parts by weight of nitrogen, whilst that of ammonia and triethylamine might be represented with one-third of that quantity, or with 4·7 parts. But all four bodies present such a marked resemblance to one another, and such a regular gradation of properties, as could not be the case unless their respective molecules were strictly comparable in constitution. For instance, their boiling-points and vapour-densities increase by a regular progression, according to the regular increase in the substitution of ethyl for hydrogen; whereas it is certain that the boiling-point and vapour-density of a body con-

taining but one proportion of ethyl and 4·7 parts of nitrogen would bear no relation of series to the boiling-points and vapour-densities of bodies containing three proportions of conjoint hydrogen and ethyl united with fourteen parts by weight of nitrogen. Moreover, by adopting the trihydric model for ammonia, corresponding to the formula H_3N''', we perceive at once why the replacement of its hydrogen must take place in thirds; or, in other words, why we cannot obtain ammonias in which one-half or one-fourth of the hydrogen is replaced by equivalent substitution, but only those in which one-third or two-thirds is so replaced; thus:—



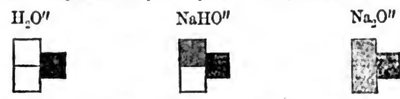
Again, ammonias are known to chemists in which two-thirds of the hydrogen are replaced by one, and the remaining third of hydrogen by some other radicle; or in which all three thirds are replaced by three different radicles, as instanced by diethyl-phenylamine Et_2PhN''', and methyl-ethyl-phenylamine $MeEtPhN'''$, for example.

Seeing, then, that there are bodies, such as marsh-gas and silicated hydrogen, of which the hydrogen is replaceable in fourths at four successive stages, and which are consequently represented with four atoms of hydrogen; and that there are other bodies, such as ammonia and phosphoretted hydrogen, of which the hydrogen is replaceable in thirds at three successive stages, and which are consequently represented with three atoms of hydrogen,—it is not *à priori* improbable that there may be yet other bodies, such as water and sulphydric acid, in which the hydrogen is replaceable in halves at two successive stages, and which must consequently be represented with two atoms of hydrogen. If we act upon water by excess of metallic sodium, for instance, we obtain the compound known as oxide of sodium; and accordingly as we represent the molecule of water by the formula HO', in which O' stands for eight parts by weight of oxygen, or by the formula H_2O'', in which O'' stands for sixteen parts by weight of oxygen, so must we represent oxide of sodium by the formula NaO', or Na_2O''; thus:—

	$O' = 8$	$O'' = 16$	
(8)	$H\,O'$	$H_2\,O''$	(16)
(16)	$H\,O'.\,Na\,O'$	$Na\,H\,O''$	(16)
(8)	$Na\,O'$	$Na_2\,O''$	(16)

But exactly intermediate between water and oxide of sodium, we have the very definite compound known as hydrate of sodium, which consists of one combining proportion of sodium and one combining proportion of hydrogen united with sixteen parts by weight of oxygen, and which cannot be represented save with sixteen parts by weight of oxygen. Now, just as the three intermediate bodies between marsh-gas and chloride of carbon force us to represent these extreme bodies with twelve parts of carbon, so that all five may appear as members of one and the same series; just as the two intermediate bodies between ammonia and triethylamine force us to represent these extreme bodies with fourteen parts of nitrogen, so that all four may appear as members of one and the same series; so must the intermediate body between water and oxide of sodium force us to represent these extreme bodies with sixteen parts of oxygen, so that all three may appear as members of one and the same series. If marsh-gas and chloride of carbon must be represented by formulæ similar to those of their intermediate bodies, and consequently with four atoms of hydrogen and chlorine respectively; if ammonia and triethylamine must be represented by formulæ analogous to those of their intermediate bodies, and consequently with three atoms of hydrogen and of ethyl respectively; then water and oxide of sodium must be represented by formulæ analogous to that of their intermediate body, and consequently with two atoms of hydrogen and of sodium respectively. In the intermediate carbon-bodies, the remaining and replaced hydrogen form fourths of the whole; in the intermediate nitrogen bodies, the remaining and replaced hydrogen form thirds of the whole; while in the intermediate oxygen compound, the remaining and replaced hydrogen form halves of the whole. Hence if the molecule of marsh-gas is to be repre-

sented by a tetrahydric model, and that of ammonia by a trihydric model, then the molecule of water must be represented by a dihydric model; thus:—



When water is acted upon by a metallic sodium, one equivalent of sodium expels one equivalent of hydrogen, to form the well-defined body hydrate of sodium, and the action proceeds no further. But when melted hydrate of sodium, at a temperature approaching that of redness, is acted upon by metallic sodium, a second equivalent of sodium turns out a second equivalent of hydrogen, to produce oxide of sodium. This replacement of the hydrogen of water by sodium at two successive stages,—the first stage of replacement taking place at ordinary temperatures, and the second stage at a dull red-heat,—is even better defined than the replacement of the hydrogen of ammonia by ethyl at three successive stages, and then the replacement of the hydrogen of marsh-gas by chlorine at four successive stages.

But the formation of ether from water by Williamson's process, affords a still closer resemblance to Hofmann's formation of triethylamine from ammonia. Water, H_2O'', when acted upon by potassium, yields hydrate of potassium, or potassic water, KHO''. Hydrate of potassium acted upon by iodide of ethyl yields alcohol, or ethylated water, $EtHO''$. Alcohol acted upon by potassium yields potassium-alcohol, or ethylated potassic water, $EtKO''$. Potassium-alcohol acted on by iodide of methyl yields the first mixed ether, or methylated ethyl-water, $EtMeO''$; and when acted upon by iodide of ethyl yields common ether, or ethylated ethyl-water, Et_2O''. None of the intermediate bodies can be represented save with sixteen parts of oxygen, and hence the terminal bodies being members of the same series, must be also represented with sixteen parts of oxygen. The intimate relations and analogies of ethylated methyl-water, $EtMeO''$, and diethylated water, Et_2O'', as regards modes of formation, modes of decomposition, boiling-point, vapour-density, etc., will not allow the molecule of the mixed ether to be represented with sixteen parts, and that of the common ether with only eight parts of oxygen; any more than the relations and analogies of ethyl-methyl-phenylamine, $EtMePhN'''$, and triethylamine, Et_3N''', will allow the molecule of the former compound to be represented with fourteen parts, and that of the latter with only 4·7 parts of nitrogen.

With regard to chlorhydric acid, there is no intermediate stage in the replacement of its hydrogen; the substitution taking place at once or not at all. We have, for instance, chloride of hydrogen, HCl, chloride of ethyl, EtCl, and chloride of sodium, NaCl, but no intermediate bodies; whence the representation of chlorhydric acid by the simple monhydric model, thus:—



In addition to the above-mentioned chemical parallel, there is one very remarkable physical relation subsisting between marsh-gas, ammonia, water, and chlorhydric acid, namely, that all four molecules occupy the same bulk. Two cubic feet, for instance, of chlorhydric acid-gas, HCl, yield one cubic foot of hydrogen and one cubic foot of chlorine. Two cubic feet of steam, H_2O, yield two cubic feet of hydrogen and one cubic foot of oxygen. Two cubic feet of ammonia, H_3N, yield three cubic feet of hydrogen and one cubic foot of nitrogen; while two cubic feet of marsh-gas, H_4C, yield four cubic feet of hydrogen and a quantity of carbon of which the gaseous volume has not been and cannot be ascertained. With equal volumes of all four gases, the marsh-gas contains four times as much, the ammonia three times as much, and the steam twice as much hydrogen as the chlorhydric acid.

Many other arguments may be adduced to show that the molecular weight of water is eighteen, corresponding to the formula H_2O'', and not nine, corresponding to the formula HO'. Thus water is concerned as the agent or product of some chemical reaction more frequently than any other body with which chemists are acquainted; but in no well-defined reaction do we ever find the reacting or resulting water expressible by nine parts,

or three times nine parts, or five times nine parts, etc., but in every case by eighteen parts, or some multiple of eighteen parts, as instanced in the following examples, which might be increased indefinitely:—

Formation of Nitro-benzol.

$$C_6H_6 \quad + \quad HNO_3 \quad = \quad C_6H_5(NO_2) \quad + \quad H_2O'' \quad \text{or} \quad 2HO$$

Decomposition of Zinc-ethyl.

$$2C_2H_6 \quad + \quad ZnH_2O_2 \quad = \quad Zn(C_2H_5)_2 \quad + \quad 2H_2O'' \quad \text{or} \quad 4HO'$$

Formation of Hydro-benzamide.

$$3C_7H_6O \quad + \quad 2H_3N \quad = \quad C_{21}H_{13}N_2 \quad + \quad 3H_2O'' \quad \text{or} \quad 6HO'$$

Decomposition of Pentachloride of Phosphorus.

$$H_3PO_4 \quad + \quad 5HCl \quad = \quad PCl_5 \quad + \quad 4H_2O'' \quad \text{or} \quad 8HO'$$

Again, in the great majority of direct compounds which water forms with other bodies, the combining water necessarily constitutes 18 parts, or some multiple of 18 parts; and when two or more bodies differ from one another by the quantities of water they respectively contain, the differential quantity always amounts to 18 parts or some multiple of 18 parts, thus:—

			$C_{10}H_{16}$	Turpentine.
$C_{10}H_{16}$.	H_2O	or	$C_{10}H_{18}O$	Monhydrate.
$C_{10}H_{16}$.	$2H_2O$	or	$C_{10}H_{20}O_2$	Dihydrate.
$C_{10}H_{16}$.	$3H_2O$	or	$C_{10}H_{22}O_3$	Trihydrate.
			CNH	Prussic Acid.
CNH .	H_2O	or	CNH_3O	Formamide.
CNH .	$2H_2O$	or	CNH_5O_2	Formate of Ammonia.

Several chemists, during what may be termed the transitional stage of their views, were accustomed to represent the molecule of water by the formula $H_2O'_2$, in which O' stands for 8 parts of oxygen, instead of by the formula H_2O'', in which O'' stands for 16 parts by weight of oxygen. But the use of this formula really showed an imperfect appreciation of the grounds upon which the abandonment of the simpler formula HO' was based; for if the molecule of water is to be represented with two proportions of hydrogen, because its hydrogen is divisible into two parts, *invertendo* it must be represented with but one proportion of oxygen, because its oxygen is indivisible. Now that the oxygen of water is indivisible is acknowledged alike by those who use the formula H_2O'' and those who use, or rather used, the formula $H_2O'_2$; and such being the case, the representation of the oxygen of water by the expression O'_2 is quite unwarrantable, for the conception of two inseparable proportions of oxygen having each the value 8, amounts after all to that of a single indivisible proportion of oxygen having the value 16.

That the oxygen not only of water but of all other well-defined oxygenated molecules always amounts to 16 parts, or some multiple of 16 parts, is abundantly evident. For the composition alone of the great majority of oxygenated bodies, prevents them from being represented save with 16 or some multiple of 16 parts of oxygen, just as the composition of chloroform prevents its being represented save with 12 parts of carbon; and as the composition of ethylamine prevents its being represented save with 14 parts of nitrogen. With regard to the remaining oxygenated bodies, their mere composition would allow them to be represented with only 8 or some odd multiple of 8 parts of oxygen, but their several relations to other bodies belonging to the more numerous class prevents them from being represented with so small a quantity; just as the relation of triethylamine to ethylamine and diethylamine prevents it from being represented with less than 14 parts of nitrogen, though from its mere composition it might be represented with only 4·7 parts of nitrogen.

From this it follows, that when two or more bodies differ in composition from one another by the proportions of oxygen they respectively contain, that difference always amounts to 16 parts or some multiple of 16 parts, as shown in the following series:—

HCl	HCl	Chlorhydric acid.
$HClO'_2$	$HClO''$	Hypochlorous acid.
$HClO'_4$	$HClO''_2$	Chlorous acid.
$HClO'_6$	$HClO''_3$	Chloric acid.
$HClO'_8$	$HClO''_4$	Perchloric acid.
$C_4KH_5O'_8$	$C_4KH_5O''_4$	Acid succinate.
$C_4KH_5O'_{10}$	$C_4KH_5O''_5$	Acid malate.
$C_4KH_5O'_{12}$	$C_4KH_5O''_6$	Acid tartrate.

Throughout there is no difference of 8 parts of oxygen, or of any odd multiple of 8 parts of oxygen, between the successive compounds.

It follows also that whenever oxygen, with or without some other element, is added to or taken from a compound, the oxygen so added or eliminated must always be represented by 16, or some multiple of 16 parts, as instanced in the following decompositions, representing the liberation of oxygen from nitrate, permanganate, and chlorate of potassium respectively.—

$$KNO_3 = KNO_2 + O'' \text{ or } O'_2$$
$$2H_2SO_4 + KMmO_4 = 2H_2O + KMm(SO_4)_2 + O''_2 \text{ or } O'_4$$
$$KClO_3 = KCl + O''_3 \text{ or } O'_6$$

Let the decompositions be expressed how they may, the oxygen displaced cannot appear as 8 parts, or any odd multiple of 8 parts; and so in hundreds of other instances.

The representation of the molecule of water by the formula H_2O was proposed by Gay-Lussac, advocated by Berzelius, and employed by Davy more than fifty years ago. Its revival is due to Gerhardt, who in conjunction with Laurent made it the basis of a consistent system of chemistry, since brought to a higher state of development by the labours of many distinguished chemists, including more especially Professor Williamson, who first introduced it into this country and supported it by a series of most masterly researches.

In accordance with this system, four well-defined classes of primary hydrides are recognized, the leading member of each of which constitutes the type or model to which an infinite variety of compounds are referable as regards both their composition and behaviour; thus:—

Monhydrides.	Dihydrides.	Trihydrides.	Tetrahydrides.
HF	H_2O	H_3N	H_4C
HCl	H_2S	H_3P	H_4Si
HBr	H_2Se	H_3As	
HI	H_2T	H_3Sb	

Formulated as above, all these hydrides occupy the same volume, and their respective vapour-densities compared with that of hydrogen as unity are the halves of their atomic weights.

METHYLATED RUM.

The following Act was passed last Session in order that rum, when methylated under the conditions specified, might be used as a desiccant for paint in place of spirit of turpentine:—

CAP. CII.—AN ACT TO REDUCE THE DUTY ON RUM IN CERTAIN CASES.

Whereas by an Act passed in the eighteenth and nineteenth years of her Majesty's reign, chapter thirty-eight, spirit of wine is allowed to be methylated duty-free, and it is expedient to allow foreign and colonial rum to be also methylated on payment of the reduced duty hereinafter mentioned: be it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords spiritual and temporal and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—

1. It shall be lawful for the Commissioners of Customs to permit and authorize any licensed rectifier of spirits, or any person who shall be duly licensed under the said re-

cited Act, to make or mix methylated spirits, to mix in the Customs warehouse, and under such conditions and regulations as the said Commissioners shall direct, foreign or colonial rum of not less degree of strength than twenty per cent. over proof, and in a quantity not less at one time than the contents of the whole cask in which the same shall have been imported, with not less than one-ninth of its bulk measure of wood-naphtha or methylic alcohol, or with such other article or substance as in the said recited Act is mentioned; and thereupon such mixture shall be allowed, chargeable only with the reduced or differential duty hereinafter mentioned, for use for such purposes and in such manner as is allowed by the said recited Act, or any Act amending the same, with regard to methylated spirit: provided that no such rum shall be so mixed as aforesaid until payment shall have been made to the said Commissioners of Customs of the difference between the duty of Customs chargeable on the importation of such foreign and colonial rum respectively and the duty of Excise chargeable on spirits distilled in the United Kingdom.

2. All wood-naphtha or methylic alcohol, or other such article or substance as aforesaid, to be mixed with such rum, shall be provided by the Commissioners of Inland Revenue for and at the expense of the person proposing to make such mixture, and the said mixture shall be denominated methylated spirit, and shall be removed, under the certificate of the proper officer of Customs, to some approved store belonging to a rectifier of spirits or to a licensed maker of methylated spirit.

3. All the powers, provisions, clauses, regulations, forfeitures, pains, and penalties contained in the said recited Act and in the Act passed in the twenty-fourth and twenty-fifth years of her Majesty's reign, chapter ninety-one, in relation to methylated spirit, shall be applied and put in force with respect to all spirits mixed under the provisions of this Act.

4. It shall be lawful to export any methylated spirit mixed under the provisions of this Act or of the said first-recited Act, under such regulations as the Commissioners of Customs or Inland Revenue shall respectively make in that behalf.

NOTE ON PODOPHYLLIN.

BY JOHN M. MAISCH.

The resin of mandrake, as it is met with in commerce, is very variable in appearance: its composition varies in accordance with the mode of its preparation.

Prof. F. F. Mayer mentions in his paper, published on page 97 of the present volume, that podophyllum contains berberina.* I can corroborate this statement, having prepared it from the mother-liquor, from which the resin is subsided.

When the alcoholic tincture is evaporated to a syrupy consistence, and poured with continual agitation into a large quantity of cold water, the sediment after drying will be found of a light-brown colour, and to contain the above alkaloid, which may be removed by repeated washings with hot water, during which process, however, the preparation darkens considerably. If the syrupy residue is precipitated by hot water, the resin will separate and fuse at once into a dark-brown cake, which is almost free of berberina, a small portion dissolved in the mother-liquor being mechanically enclosed by it.

The mother-liquor has an acid reaction, and from it the berberina may be obtained by concentrating it and precipitating muriate of berberina by an excess of muriatic acid. The mother-liquor from this precipitation is still of a yellow colour, which is due probably to some colouring matter of an acid nature. The muriate of berberina may be purified in the usual manner by dissolving in alcohol.

The resin separating from hot water, settles pretty rapidly, but from cold water it subsides with difficulty, because, most likely, of the slow separation of the native salt of berberina; but if muriatic acid be added to a certain extent, the liquor becomes clear in a short time, since the salts of this vegetable alkali are insoluble in mineral acids. Resin of podophyllum prepared in this way is of a pale greenish-brown colour.

It is obvious then from these statements that the so-called podophyllin may, according to the mode of its preparation, contain no alkaloid, a small portion of the native salt, or a larger proportion of muriate of berberina, and that its action upon the animal economy must be modified at least to a certain extent.

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* See also Pharm. Journ. vol. iv. p. 517.

I am not aware of any physiological experiments instituted with berberina or any of its chemical combinations. But some of the drugs in which it occurs are still highly prized as tonics, and are regarded as possessing special action upon the liver; this is, among others, the case with the bark of berberis and with calumba. Podophyllum has long been regarded as a vegetable substitute, to a certain extent, for calomel; and the question arises, whether the pure resin has any action at all upon the liver, or whether it is merely cathartic, being directed to that organ only when combined with berberina? This is a subject requiring investigation by the physiologist; but, to be of any value, the experiments ought to be conducted with the pure principles, and not with a mixture of known and unknown constituents, even if this was commonly called, after the fashion of the Eclectics, by a name rightfully belonging to a pure chemical principle.

In the preparation of the resin of podophyllum, by precipitation with water, a considerable quantity of muriate of berberina may afterwards be obtained, and this salt should be collected, because it undoubtedly possesses some therapeutic value. It will be remembered that muriate of berberina is identical with the so-called hydrastine of the Eclectics.—*Amer. Journ. of Pharm., July*, 1863.

CORTEX MUSENÆ.

This bark was formerly known in commerce as *Cortex Brayeræ anthelminticæ*, under the belief that it was that of the tree the flowers of which are known as Koosso. The source of this bark has long remained in doubt, and the plant from which it is obtained, a tree, was placed in the Order of Leguminosæ, until Buckner, Hochstetter, and Steudel proved it to be the *Rottlera Schimperi* (Nat. Ord. *Euphorbiaceæ*, sect. *Crotoneæ*), a large tree of Abyssinia. The bark of this tree, mixed with koosso, is employed in that country for the treatment of tape-worm. Musena bark, as it occurs in commerce, is in quills of several inches in length, from one to two inches in width, the outer surface very uneven, rough, and fissured, the epidermis of a brown colour, underneath which there is a very thin greenish cellular coat overlying a comparatively thick periderm of a pale-yellow colour and hard granular structure, and beneath this the liber of a very tough and long fibrated tissue. It possesses no odour; the periderm has little taste, while the liber possesses a peculiar sweetish nauseating one, and causes an acrid, long-continuing sensation in the fauces. C. Thiel, who has lately examined this drug, found as the active ingredient, a non-crystallizable substance of a very acrid taste, having many properties in common with saponin, but distinguished from it by a greater solubility in alcohol. Besides this, the Musena bark contains a fatty wax-like substance, a yellowish colouring matter, extractive, and a bitter principle. It yields 5½ per cent. of ashes, consisting of potassa, soda, lime, magnesia, sesquioxide of iron, hydrochloric, sulphuric, phosphoric, carbonic, and a large quantity of silicic acid. Very little is known as to the therapeutical action of the drug. Girtler, of Vienna, has prepared an alcoholic extract, which is now being tried by the profession.—*Neues Jahrb. f. Pharm., bd.* xviii., *January*, 1863, *p.* 374, *and Amer. Journ. Pharm.*

THE BITTER PRINCIPLE OF GENTIAN.

Chemists have long failed to discover or isolate the body to which gentian owes its purely bitter taste, though there has been eliminated an acid principle, gentianic acid. Ludwig and Kromeyer have at last obtained it from an alcoholic extract of the fresh root of gentian (*lutea*), the watery solution of which transferred its bitterness to animal charcoal by two successive treatments. The charcoal was extracted with alcohol, the tincture evaporated, the residue freed from precipitable matter by means of oxide of lead, and after removal of the latter by sulphuretted hydrogen, evaporated to the consistence of a syrup; the latter precipitated the principle by agitation with ether. This *gentiopicrin* is crystallizable, is readily soluble in water and alcohol but not in ether, neutral, and not precipitated either by tannin or subacetate of lead. It is a glucoside, for contact with mineral acids, as well as oxalic and acetic acids, splits it into fermentable sugar and a brownish, yellow, amorphous body, *gentiogenin*. The formula $C_{40}H_{30}O_{24}$ for gentiopicrin requires—

Carbon............ 51·948 per cent.
Hydrogen ...... 6·494
Oxygen .... 41·558.

—*Amer. Drug. Cir., from Sitzungsber. Wien. Akademie, bd.* xlv., *Jan.* 1862, *in Chem. Centralblatt*, 1863.

PHARMACY IN SOUTH AMERICA.

The Pharmaceutical Association of Buenos Ayres has lately received the official recognition of the Argentine Government, and has been established on an enlarged basis under the title of *Sociedad de Farmacia Nacional Arjentina* (National Argentine Society of Pharmacy). It has also petitioned the Government for the formation of a School of Pharmacy at Buenos Ayres, and appointed a committee to consider the best means of ensuring the success of such an institution. The following are the bases upon which the Society declares that it has been founded:

To encourage a spirit of association among pharmaceutists in the Argentine Nation and to strengthen the bonds of confraternity and harmony between them.

To establish relations with those of other countries in order to promote conjointly the elevation, and moral and material advancement of pharmacy.

The Society further pledges itself to establish a Benevolent Fund for the pecuniary assistance of such of its members as may be overtaken by misfortune; to promote the founding of a School of Pharmacy, and the formation of a National Pharmacopœia; also to maintain the official journal of the Society, with the endeavour that it should be worthy of its object and conduce to the advancement of science.

This journal which bears the title of *Revista Farmacéutica* ('Pharmaceutical Review') is in the Spanish language, and published quarterly at Buenos Ayres; it has just completed its fourth volume, the last number containing an amusing notice of the state of pharmacy in England. D. H.

ON THE CHEMICAL COMPOSITION OF ROSA GALLICA.

BY M. FILHOL.

The author published last year a work relative to the colouring matter of flowers, in which the occurrence of quercitrin was noted.* In again examining the flowers of the red rose, he has ascertained that their astringent property ought to be attributed in great degree to the quercitrin, and that but traces of true tannin can be found. When the petals, coarsely powdered, are exhausted with ether, a yellow tincture is obtained, the flowers retaining their beautiful red colour. The ethereal tincture by evaporation yields a soft greenish-yellow extract. Boiling water dissolves a part of this, forming a yellow solution, whilst a greenish fatty matter is left. This solution gives a deep bottle-green precipitate, with persalts of iron. It is coloured bright yellow by alkalies, and gives with lead salts, lakes of an intense yellow colour; and lastly, when evaporated to dryness, it leaves a dry residue, which assumes a lively yellow tint when moistened with strong hydrochloric acid. Quercitrin may be isolated from the lead precipitate. Rose leaves contain also a large portion of uncrystallizable sugar (20 per cent.), some cyanin, and gallic acid.—*Répert. de Pharmacie, May,* 1863, *and Amer. Journ. Pharmacy.*

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* Pharm. Journ. second series, vol. iv. p. 133.

MISCELLANEA.

Deaths from Carbonic Acid Gas.—On Wednesday, March 25th, a lad named Dewey, employed at the Lion Brewery, Southsea, mounted a forty-barrel vat, and while looking through the manhole in the cover lost his balance, and fell into the vat among a quantity of partially wet hops, when he soon fell a victim to the effects of the gas. The engineer of the brewery, hearing what had occurred, descended the vat by means of a rope-ladder, and he also became senseless. Another man, although cautioned not do so, ventured into the vat, and shared the fate of the others. The vat was then broken open, and the bodies taken out to await an inquest.

On Friday, August 21st, an inquest was held at the Five Bells, Bromley, on George Briggs, aged fifty-two years. Deceased was in the employ of Currie and Co., distillers. He went down through a "man-hole" into a huge vat, for the purpose of stirring up the waste liquor and solids which were at the bottom. He tested, by means of a lighted candle, for foul gas, but found none. No sooner had he got to the bottom of the ladder, however, than he exclaimed, "There is gas here;" and before assistance could be got he fell backwards, dead. Dr. Gill said the deceased must either have tested for carbonic gas very carelessly, or else the disturbance of the liquor upon his descending must have caused the gas to rise and overcome him. The jury returned a verdict of "Accidental suffocation by carbonic acid gas," and recommended that some means should be devised for the better ventilation of the vats in future.

Alleged Poisoning by Arsenic.—A verdict of wilful murder has been returned by a coroner's jury against Lydia Williams, of Fishguard, Pembrokeshire, who is suspected of having killed her husband by the administration of arsenic. The deceased was taken ill on April 12th and died May 24th, and the symptoms described by witnesses resembled those of an irritant poison. An analysis was made by Professor W. Herapath, of Bristol, who failed to discover arsenic; he was, however, of opinion that "the state and appearance of the various parts exhibited all the *secondary* effects of arsenic." Mr. Herapath also stated that "every poison has an inflammatory tint peculiar to itself. Phosphorus produces a bright scarlet, arsenic a deep red, oxalic acid another, and mercury another." The prisoner was tried before Baron Wilde, when evidence corroborative of the above was given. Mr. Herapath stated that, although he had failed to discover any poison in the viscera of the deceased, he had received some powders from Superintendent Jones, in which he had found twenty-seven grains of arsenic in sixty-three of vegetable meal. It was stated in evidence that, invariably after taking the food prepared by the prisoner, violent sickness was produced; and this was not the case when the food was prepared by the sister of the deceased. The jury returned a verdict of "Guilty" of the intent, but not of the murder; and the prisoner was sentenced to penal servitude for life.

Poisoning by "Chloroformic Anodyne."—A case of poisoning by a new remedy, called "chloroformic anodyne," is given by Dr. Harley in the 'Lancet' of July 4th. The patient had given to her, by mistake for a black draught, six drachms of the anodyne. She immediately felt sick, and vomited, and in less than ten minutes after she had taken the medicine stupor supervened, and on the arrival of medical aid she was found perfectly insensible, the pupils contracted, the face livid, and the breathing stertorous. The stomach-pump was applied, and the remainder of the poison ejected—about two hours after it had been swallowed. As the surface of the body was beginning to feel cold, artificial respiration was resorted to, and a pint of hot coffee, containing three drachms of spirit of nitric ether, was injected into the stomach. The pulse then became perceptible at the wrists, and the artificial respiration was discontinued, and a constant stream of cold water was applied to the head with great benefit, as the pulse immediately got quicker and stronger. The above treatment was continued for about two hours, when the patient was able to reply to questions; but she remained more or less under the influence of the drug for fifty-four hours. The chief ingredients of the 'chloroformic anodyne' are said to be a strong solution of opium, some chloroform, and a few drops of hydrocyanic acid.

Accidental Poisoning by Laudanum.—On Tuesday, September 1st, an adjourned inquest was held at Moxley, near Wolverhampton, before Mr. Hooper, coroner, on the body of John Albert Vann, aged six years. It was stated in evidence that on the evening of the previous Tuesday, the child complained of pain in the bowels, and his sister was sent to the shop of Mr. Woolley, a druggist, for a pennyworth of tincture of rhubarb. The medicine, about a teaspoonful, was administered, and the child put to

bed. About two hours afterwards the mother heard a moaning noise, and upon going upstairs found the child insensible, and with his eyes fixed. In about a quarter of an hour he complained of giddiness, and said, "It is what the man sent that has made me so. I shall die; and if I do, you hang that man." Mr. Woolley was sent for, who prescribed an emetic, and said the vomiting was to be kept up; the child to be prevented from continuing asleep. The emetic acted, but the product was thrown away. The child grew worse, and on the following morning Mr. Larkin, a surgeon, was sent for, who applied the stomach-pump, but death took place in a few minutes. A *post-mortem* examination was made by Mr. Latham, who found large quantities of blood in the organs of the brain, and the blood generally in a very fluid state. The stomach was empty, and no trace of poison was found in it; he was, however, of opinion that death had resulted from some narcotic poison. The child who had been sent for the tincture of rhubarb pointed out the bottle from which she had been served. This bottle proved to be the one in which laudanum was kept. After the deliberation of the jury, the coroner, in addressing Mr. Woolley, said that the jury had found a verdict to the effect that there was no direct evidence to show the cause of the deceased's death. Both the jury and himself felt that the medical evidence had to some extent failed. But there was no doubt in the minds of the jury, or in his own mind, that this child had died from having had poison administered to him that had been sold by him for tincture of rhubarb. Had the vomit been preserved, there would have been no legal doubt in the minds of the jury, and then he would have occupied a different position; but, inasmuch as it had been thrown away, and the medical evidence had in consequence not been of sufficient strength to justify a verdict of manslaughter, a legal doubt had been occasioned, and, acting upon his instructions, the jury had given him the benefit. He had, however, to caution him in their names, and to remark upon the very serious consequences which might result from a repetition of such conduct. In the event of another accident happening through Mr. Woolley's dispensing, this case would be remembered. He was sorry to find, from inquiries he had made, that it was not the first time he had sold poison by mistake. He should like the public to know clearly and distinctly that the poison had been sold by him in mistake, and he trusted that the censure he was then called upon to administer would exercise a salutary influence. Mr. Woolley, who is about twenty-five years of age, and has been an articled apprentice to a surgeon, was much affected by the reprimand of the coroner.

Poisoning by Prussic Acid.—An adjourned inquest was held at Coventry on Thursday, September 3rd, by Mr. Alfred Carter, coroner for part of the northern division of Warwickshire, at the village of Fillongley, near Coventry, on the bodies of William Henry and Julia Dalby, husband and wife, who were suspected of having died from the effects of poison. The deceased man was a miller, and son of a farmer living near Hinckley, in Leicestershire; the woman, who was only about seventeen years of age, was the daughter of labouring people residing at Fillongley. They were married in February last, since which period they are believed to have lived very happily together. On Monday, the 24th August, the wife was found dead. In consequence of the suddenness of her death, an inquest was hled on the body and adjourned, to enable a *post-mortem* examination to be made. On Monday, the 31st, the husband exhibited reluctance to go to his work as usual. He went upstairs and lay down on the bed. A few minutes afterwards his mother-in-law saw him place a bottle on a box by the bedside, and immediately fall back as though in a fit. He died almost instantly. The bottle placed on the box was labelled "Poison—prussic acid." A letter in the handwriting of Dalby was found after his death, in which he stated that his wife had taken poison of her own accord, but with his knowledge, and that he had promised to follow her example. At the adjourned inquest Dr. Alfred Hill, public analyst for the borough of Birmingham, stated that he had made an examination of the intestines of the deceased woman, and had found prussic acid present in a quantity sufficient to cause death. It was further shown that during the last few weeks the husband had got the carrier between Bedworth and Arley to purchase for him several quantities of prussic acid, representing that he wanted it for the horses. No evidence affording a clue to any motive for the crime was forthcoming. The jury returned a verdict in the case of Julia Dalby of "Wilful Murder" against the husband, W. H. Dalby; and in the case of the latter they gave a verdict of *felo de se.*

Suicide by Prussic Acid.—An inquest has been held at Sheffield, respecting the death of a woman named Squires, who died in childbirth, in consequence of the improper

treatment she received from a druggist and accoucheur named Harvey Oakes. The dread of the pending inquest affected Oakes so much that he drank a large quantity of prussic acid. In his room was found a letter signed Harvey Oakes, to the purport that he was innocent of the imputation about to be sworn against him, and that it was more than he could bear. The jury returned a verdict to the effect that the woman died from the effects of the improper treatment by Oakes, and Charlton, the midwife, and that Oakes committed suicide during temporary insanity.

DEATH OF PROFESSOR THEODOR W. C. MARTIUS.

We have to announce with regret the death of this amiable and well-known man of science, which took place, after a long and suffering illness, on the 15th September. Dr. Martius held for many years the Professorship of Pharmacy and Pharmacognosy in the University of Erlangen; he was a Knight of the Royal Prussian Order of the Red Eagle, and member of many scientific societies, including the Pharmaceutical Society of Great Britain, to whose Museum and Journal he frequently contributed.

TO CORRESPONDENTS.

G. W. P. (Manchester).—*Crimson Marking Ink* may be made as follows:—

℞ Nitrate of Silver	℥j
Carbonate of Soda (crystals)	℥iss
Tartaric Acid	ʒij ℈ij
Liquor Ammoniæ (·882)	fl. ℥ij
Carmine	gr. vj
White Sugar	ʒvj
Powdered Gum Arabic	ʒx
Distilled Water	q.s.

Dissolve the Nitrate of Silver and Carbonate of Soda separately in distilled water; mix the solutions; collect and wash the precipitate on a filter; introduce the washed precipitate, still moist, into a Wedgwood mortar, and add to it the Tartaric Acid, rubbing them together until effervescence has ceased; dissolve the carmine in the Liquor Ammoniæ, and add it to the Tartrate of Silver, then mix in the White Sugar and Powdered Gum, and add as much distilled water, if required, as will make fl. ℥vj of the mixture.

Chemicus (Bury St. Edmund's).—A solution of bisulphate of lime for the purpose of cleansing foul beer-casks may be used in the proportion of one pint of the solution to one gallon of water. This should be put into the cask, which is then shaken, so that the solution may come in contact with every part of the interior. This should be repeated several times, and the cask then rinsed with water.

T. S. K. (Rochester), and *C. K.* (Haverhill).—*Poisoned Grain Bill.* It will be seen, on reference to our number for August, page 46, that this Bill has passed, and we presume that it would come into operation from the date of the Act, July 28, 1863. The provisions of the Act will be found at page 81.

J. B. (Brighton).—No. The certificate of examination of the Pharmaceutical Society would be available in obtaining a situation under Government.

B. W. (Torpoint).—*Tincture of Sumbul.* Vol. xv., page 508.

"*A Commencing M.P.S.*"—*Furniture Cream.* Pearlash, 2 oz.; soft-soap, 4 oz.; bees'-wax, 1 lb.; water, 1 gallon. Boil until the whole is united and forms a creamy liquid when cold. (*Cooley.*)

Mynsicht's Elixir of Vitriol.—We have received several communications on this subject, which will claim attention in our next number.

A Correspondent ("*Anti-Oppression*") and "*A Registered Apprentice*" are thanked for their communications.

R. A. P. S. (Sheffield).—Fownes's 'Manual of Chemistry' and Bentley's 'Manual of Botany,' price 12*s.* 6*d.*

Instructions from Members and Associates respecting the transmission of the Journal before the 25th of the month, to Elias Bremridge, Secretary, 17, Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Messrs. Churchill, New Burlington Street. Other communications to the Editors, 17, Bloomsbury Square.

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. V.—No. V.—NOVEMBER 1st, 1863.

THE BRITISH PHARMACEUTICAL CONFERENCE.

In a former number of this Journal, at page 58 of the present volume, we published an address, signed by a considerable number of the members of the Pharmaceutical Society, and some others, inviting their pharmaceutical brethren to join them at a Conference to be held at Newcastle-on-Tyne at the time of the meeting of the British Association there. The Conference has met, and its proceedings were fully reported in our last number; but as the reasons which have led to the formation of this new Association have not yet been very fully discussed, we propose to offer a few observations upon the subject here. The proposition for the formation of this Conference originated with provincial members of the Pharmaceutical Society, and it appears to have been designed to meet what was felt to be a provincial want. When Lord Bacon said, "Every man is a debtor to his profession, from the which as men do of course seek to receive countenance and profit, so ought they to endeavour of themselves, by way of amends to be a help and ornament thereto," he certainly did not limit the application of the axiom to residents in the metropolis. The opportunity of meeting for scientific purposes and for the cultivation of friendly feelings is no less desirable among provincial pharmaceutists than it is among those who reside in London. Means are provided for having such meetings in London, and in some of the larger provincial towns, but there has hitherto been felt to be a want of suitable opportunities for bringing into active operation the latent or cultivated talents of men who have made pharmacy their study and their profession, but who, from their isolated positions in the provinces, are deprived of the stimulating influence of scientific association with men of their own calling. These men cannot come, or do not come, to London to join in the investigation and discussion of subjects affecting the interests of pharmacy. They feel shut out from communion of thought with their fellows, and lose the interest they would otherwise experience in the progress of scientific inquiry.

It is not merely with reference to pharmacy that the prejudicial influence of provincial isolation has thus been felt. Similar effects have been experienced in other departments of science, and it was with the view of affording a remedy upon a broad scale for such effects that the British Association for the Advancement of Science was instituted. Other associations have also been formed upon a similar basis. Thus the meetings of the Social Science Congress are held from year to year in different parts of the country, like those of the British Association. So in like manner the British Medical Association, the British Archæological Association, and other associations, meet in the provinces with the view of stimu-

ating to work, and of bringing out for the benefit of others the results of the investigations, of men who would otherwise sink into a state of inactivity.

If good has resulted, and still continues to result, from the operations of these different bodies, it may equally be expected to attend the efforts of the British Pharmaceutical Conference. In fact, the objects of the Conference are such that all must agree in desiring to see them efficiently carried out. The constitution of the Conference expresses its objects in general terms, and they may be stated to be, the promotion of friendly intercourse, the systematic arrangement of subjects for investigation, the discouragement of adulteration, and the union of existing associations and societies for the carrying out of these purposes. The rules do not fetter the future action of the Society by needless restrictions, and those who framed them evidently had more faith in the good sense and good feeling of future meetings than in the power of red tape to direct their course.

With reference to two of the proposed objects of the Conference, a few remarks may be offered. The suggestion of subjects for investigation, and the allotment of such subjects to individuals who may be willing to undertake them, appears to be copied from the plan adopted by the American Pharmaceutical Association, which has been in operation for many years, and which has resulted in the production of several useful contributions. Something of a similar sort has also been previously attempted in this country. So long ago as 1845, the Pharmaceutical Society, at the instigation of Dr. Pereira, appointed a Scientific Committee for the promotion of pharmacological knowledge, and it formed part of the objects of that Committee to suggest subjects for investigation and to induce competent investigators to undertake them. The great and principal obstacle to the progress of the work at that time was the interference of trade interests, and the suspicions and jealousies which speedily arose from this cause. It is to be hoped that the new Association will not be rendered inoperative by similar influences. We feel assured that much discretion and judgment will be exercised by the Executive Committee, nor do we doubt that there will be much occasion for them.

The subject of adulteration is one which the Conference propose to deal with, and this also is a subject the full and candid investigation of which is beset with some difficulties. The word adulteration has become a sort of bugbear, from the adulterated truth promulgated by some who set up as teachers upon the subject. We are sure that the gentlemen composing the Committee on Adulterations are as much aware as we can be that their task involves especially the exercise of much tact and judgment. A roving commission put into force against a number of retailers, and a report rendered piquant by the publication of names, is not what is required, and, we believe, is not what is intended. On the other hand, we have from time to time published what may be termed illustrations of British Pharmacy in connection with the question of purity, and are well aware that there is still scope for further illustrations in that direction.

Of work to be done there will be no lack, of workers to carry out what is proposed it may be hoped there will be an ample supply, of advocates for the cause there are so many that the exceptions must be few, yet among those who approve of the objects there may be some, as we believe there are, who entertain doubts with reference to the means adopted for carrying those objects into effect.

Members of the Pharmaceutical Society can hardly fail to approve of the objects of the Conference, for they are quite congenial with the spirit and purpose of the Society, and have always formed leading features of the proceedings at our pharmaceutical meetings. Indeed, the meetings of the Conference, consisting almost entirely of members of the Pharmaceutical Society, are practically provincial pharmaceutical meetings under another name. It may be thought by some that there were already sufficient means for carrying out the objects of the Conference without the institution of a new Society. Why, it may be

asked, should the members of our Society create a new institution for the purpose of doing work which rightly belongs to the Society to which they are already attached? Is it that there are too many workmen in this field, too many contributing to the scientific meetings of the Pharmaceutical Society, or that there is something in the constitution of the Society or the arrangements connected with the meetings that does not accord with the nature of the work to be done? Certainly there is one part of the present arrangements for the pharmaceutical meetings of the Society that would be directly opposed to a leading object of the Conference, and that is the arrangement for always holding the meetings in London. This, however, could easily be altered; and as there are always two or three months in the year during which there are no meetings held in London, it would be easy during that time to adjourn the meetings to the provinces. We believe this question has been considered by the Conference or its promoters; and as the decision has been adverse to the adoption of such a plan, we have no doubt good and sufficient arguments have been advanced in justification of the plan that has been decided upon, and we trust that any fears of an influence resulting from this plan that may militate against the continued prosperity of our pharmaceutical meetings will prove entirely groundless.

TRANSACTIONS

OF

THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *October 7th*, 1863,

Present—Messrs. Bird, Deane, George Edwards, J. B. Edwards, Evans, Haselden, Hills, Meggeson, Morson, Proctor, Reynolds, Savage, Squire, and Waugh,—the following were elected

MEMBERS.

Thomas Kerfoot .... MANCHESTER.
Thomas Howse Flooks........................... SHERBORNE.
Joseph Dulley .... WOLVERHAMPTON.

The following, having paid their arrears and their subscriptions for the current year, were also restored to Membership:—

Samuel Parr .... NOTTINGHAM.
Henry Monro .... NEWCASTLE-ON-TYNE.
Samuel Maskery .... LIVERPOOL.
William Croley .... EDINBURGH.

A communication was received from the Registrar of the Royal College of Physicians, to the effect that certificates of attendance on the courses of Lectures on Chemistry, Botany, and Materia Medica, delivered by Professors Redwood and Bentley, and certificates of attendance on the Course of Practical Chemistry in the Laboratory of the Society, will be received as satisfactory evidence of study of these subjects by Candidates for the College licence.

EXAMINATION PRIZES.—MINOR.

Resolved—"To award, on the recommendation of the Board of Examiners, books to the value of Two Pounds to the Candidate who, in the course of the year, has passed the best examination in the Translation of Prescriptions, Practical Dispensing, and Pharmacy."

Major.

Resolved—"That Candidates who, in the opinion of the Board of Examiners, exhibit a proficiency in the several subjects embraced in this examination, be placed on the list of honours; and that the Candidate of this class, who, in the course of the year, has passed the best examination in Materia Medica, Botany, and Chemistry, receive the Pereira Medal."

Resolved,—"That whereas, during the three years in which the Jacob Bell Memorial Scholarships have been open for competition, no candidate has ever appeared for the Senior Scholarship, and the benefit of one-half of the endowment is thus lost to the Society, the Council shall have power, under such circumstances, or in the event of a Senior or Junior Scholarship, from other reasons, not being awarded, to grant *two* in one class if more than one candidate applying therein be reported worthy by the Board of Examiners."

SUBSCRIPTIONS RECEIVED FOR THE BENEVOLENT FUND since the last announcement:—

Breton, Walter, Brighton	£0	10	6	Kent, Thomas, 226, Blackfriars Road	£0	10	6
Christopher, William, Crickhowell	0	5	0	Parkes, John C., Woolwich	0	10	6
Harris, W. H., Northampton	0	10	6	Picnot, Charles, Strood	1	1	0
Hollier, Elliott, Dudley	0	10	6	Rea, Edward, 115, Wardour St.	1	1	0
Farrow, William, Woburn	0	5	0	Smith, John, Southampton	0	10	6
Morton, Henry, Ramsgate	0	5	0				

MAJOR EXAMINATION, 21*st October*, 1863.

Gowland, William .... Sunderland.
Heathorn, William .... Maidstone.
Hopgood, Richard Cooper .... Chipping Norton.
Olivier, Jacques Léon .... Mauritius.

MINOR EXAMINATION.

Chapman, Charles William .... London.
Cooper, Albert .... Yeovil.
Gowland, George Robert .... Sunderland.
Haddock, George John .... Norwich
Rowe, Robert .... Yeovil.

REGISTERED APPRENTICES.

NAME.	RESIDING WITH.	ADDRESS.
Akehurst, Arthur Frederick	Mr. Savage	Brighton.
Barry, Henry	Messrs. Ritson & Sons.	Sunderland.
Hall, Alfred Richard	Mr. Lawrence	Kensington.
Ham, William	Mr. Houghton	Oxford.
Hickman, Frederick	Mr. Dowman	Southampton
Holmes, Walter Murton	Mr. Mohun	Ramsgate.
Kinch, Edward	Mr. Kinch	Henley-on-Thames.
Lindsay, Walter Vickress	Mr. Williams	Horsham.
Miles, Frederick George	Mr. Mount	Canterbury.
Stephens, John James	Mr. Longstaff	Hereford.
Wilmot, Benjamin	Mr. Cottingham	Lincoln.

PHARMACEUTICAL MEETING.

Wednesday, October 7th, 1863.

MR. T. H. HILLS, VICE-PRESIDENT, IN THE CHAIR.

The following

DONATIONS TO THE LIBRARY AND MUSEUM

were announced, and the thanks of the Society given to the respective donors thereof:—

The Proceedings of the Linnæan Society.
The Proceedings of the Royal Institution.
The Proceedings of the Medical and Chirurgical Society.
The Proceedings of the American Pharmaceutical Association. For 1857, 58, 59, 60, 62.
Report of the Smithsonian Institution for 1862.
Bulletin de la Société Botanique de France.
Bulletin de la Société Chimique de Paris.
Reglamento de la Sociedad de Farmacia Nacional Arjentina. From the respective Societies.
The American Journal of Pharmacy.
The Chemist and Druggist.
The Chemical News.
The Dental Review.
The British Journal of Dental Science.
The Journal of the Chemical Society of London.
The Photographic Journal.
The Educational Times.
Revista Farmacéutica, publicada por la Sociedad de Farmacia Nacional Arjentina.
The Technologist.
Journal of the Society of Arts.
The Veterinarian. From the respective Editors.
The Dictionary of Chemistry. Vol. I. By Henry Watts, B.A., F.C.S.,
Notes on the Silk-producing Insects of India and the adjacent Countries. By Frederic Moore.
Statistical Tables of Patients under Treatment in the Wards of St. Bartholomew's Hospital during 1862. By Dr. G. N. Edwards.
Commentar zur Preussischen Pharmacopoe. Part I. Von Dr. Friedrich Mohr.
On Colour Blindness. By Jabez Hogg. From the respective Authors.
Specimens of Scinde and Candeish Opium in Cakes.
Specimen of Chinese Investment Opium in Ball.
Bark of *Echites antidysenterica.*
Bark of *Alstonia scholaris.* From Dr. Forbes Watson.
Specimen of Hashish from Constantinople. From Mr. Peter Squire.
A Human Calculus weighing ℥iij gr. xxx.
Cast of a Human Calculus found in the pelvis of a Roman skeleton, exhumed from an ancient barrow at Litlington, Cambridgeshire. From Mr. A. Deck.
Specimen of *Roccella.* From Dr. Waring.
Dried specimen of *Andropogon* which yields the Lemon Grass Oil of Travancore. From Dr. Waring.
Fruits of *Citrus Bergamia.* From Messrs. Piesse and Lubin.

The VICE-PRESIDENT said, that in the unavoidable absence of the President, he had been called upon to preside. He regretted the President was not here on this occasion, but in his name he gave them all a hearty welcome. He had

the pleasing duty this evening of distributing the medals and certificates of honour awarded by the Council to the students of the past session, and he felt sure that what would be stated in reference to these awards would be most gratifying to the meeting. He then called upon the Professors to announce the results of the examinations.

CHEMISTRY AND PHARMACY.

Professor REDWOOD said he had been so long accustomed to appear there from year to year, and so uniformly to make the same statement, that he feared it might be thought that it was a mere stereotyped address. It was not so, however; and he could only explain why it thus appeared, on the ground that he dealt more with facts than with compliments, and he could not fail to be pleased when he found the facts on these occasions were uniformly the same. He found at the end of every session that there was reason to be satisfied with the industry, zeal, and attention displayed by the pupils; it was true that he had to make this statement year after year, but still the satisfaction resulting from it was none the less. If any drawback existed at all, it did not respect quality, but quantity. The Professors would feel much greater satisfaction, and would go through their duties much more agreeably, if they had larger numbers to lecture to. During the last session he had had a most attentive and zealous class; eight students competed in the prize examination, and he could say of them all that they manifested a fair amount of knowledge and intelligence; but there were two especially, and he said it without disparagement to the others, who had entirely outstripped the rest, and almost put them out of court,—gentlemen who were able to answer the questions given almost as the Professor himself would have done. When he stated that he took 800 marks as representing the highest value of the answers, and that one obtained no less than 765, it would be at once seen that the highest credit was due to him. The second of these candidates gained 710 marks. Without disparagement to the other competitors, it was most desirable to distinguish these two, for they stood far in advance; and the result might serve to indicate to those who propose to compete in these examinations, that they must prepare themselves as much as possible. It was not proposed to give certificates unless they came up to a certain standard. He would say, in conclusion, that in awarding the values to the various answers, he possessed no knowledge whatever of the competitors.

The questions and awards were as follows:—

1. Give the equivalents in weights of the metrical system for the following:—

¼ grain emetic tartar	10 grains Dover's powder
1 grain calomel	1 drachm sulphate of potash
4 grains antimonial powder	1 ounce Epsom salts

2. A piece of metal (a), weighed in air in the usual manner, weighs 210 grains; suspended from one end of a balance and immersed in water, it weighs 180 grains; immersed in like manner in a liquid (x), it weighs 183 grains. What are the specific gravities of the metal (a) and the liquid (x)?
3. How is the latent heat of water determined, and what are the latent heats of water and of steam, the latter at 212° Fahr. and 312° Fahr. respectively?
4. Describe the manufacture of oil of vitriol, and of carbonate and bicarbonate of soda.
5. Give the formulæ representing the composition of cane-sugar, grape-sugar, and mannite. Describe the relative sweetening powers of cane-sugar and grape-sugar, and the extent to which they are respectively soluble in cold water.
6. Explain the processes of the London Pharmacopœia for the preparation of diluted hydrocyanic acid, potassio-tartrate of iron, and solution of chlorinated soda.
7. What are the impurities likely to be present in Glauber's salt, sulphate of copper, and salt of tartar, as met with in commerce; and how would you detect such impurities?

8. Give the formula representing the composition of nitrous ether. Describe the best method of producing the ether, the reactions which occur in its production, its properties, and the changes to which it is subject.

MEDAL............................Michael Carteighe.
CERTIFICATE OF HONOUR ...Charles Umney.

BOTANY AND MATERIA MEDICA.

Professor BENTLEY said that his duty, like that of his colleague, was a most gratifying one on the present occasion, as he had, as in past years, when called upon to announce the results of the examination, to speak in very high terms of the several competitors for the prizes, and of the conduct and diligence of his class generally. He was quite satisfied; indeed, from long experience as a teacher in many institutions, he must add that in none of them had he found more zealous, better conducted, and attentive students than in the Pharmaceutical Society. He agreed with Dr. Redwood in reference to the numbers attending the lectures. He would much prefer lecturing to two or three hundred than to forty or fifty students; but when he compared the last session with the one preceding, he found no small increase in numbers, and he thought the fact of between sixty and seventy students coming forward voluntarily during that period to attend lectures was a most gratifying and encouraging one, and augured well for the future. With regard to the last session, Professor Bentley felt bound to speak of the uniform good conduct of the students, both at the lectures in Bloomsbury Square and at the Royal Botanic Gardens. This fact was a most gratifying one to him, as he felt sure it must be also to the Council. Neither at the Pharmaceutical Society nor at the Botanic Gardens had the students committed to his charge ever abused the trust reposed in them; and although he could not speak from so long an experience as Dr. Redwood, yet he could affirm that during the fifteen years he had been connected with the school, he had never had to make any complaint of importance against them. Professor Bentley then announced that Mr. Michael Carteighe was the first in order of merit at the Prize Examination. Of this gentleman he could truly say that he was an ornament to his teachers and to the school in which he was educated, and he felt sure that he would distinguish himself in his future career. The value of his answers at the written examination was at least equal to that he had ever met with in any institution, and in the *vivâ voce* examination he had taken the highest value allotted to the answers. The Council had therefore awarded him the medal, and there could be no doubt that he had earned it honestly, and fully merited the distinction. Of Messrs. Watts and Umney, the two next in order of merit, he could also speak in high terms. He trusted that students of such merit would always compete in these examinations. The answers of both were most creditable, and there was but little difference in the value attached to them, although Mr. Watts had slightly the advantage. Much credit was also due to Mr. Phillips, who had obtained a certificate of merit. Professor Bentley concluded by saying that he coincided with Dr. Redwood on the necessity of instituting a high standard, which must be reached before prizes or certificates could be awarded.

The questions for the written examination were as follows:—

1. Describe the structure, form, and size of Starch Granules; and show how West Indian arrow-root or Maranta starch may be distinguished from sago-meal and potato-starch.
2. Describe briefly the internal structure of the Wood of a Dicotyledonous stem.
3. Define the following:—Hair, Prickle, Spine, Rhizome, Corm, Bulb, Panicle, Capitulum, Umbel, Thalamus, Receptacle, and Legume.
4. Give a brief sketch of the changes which the Sap undergoes in the leaves and other

green parts; and show the practical applications which arise from a knowledge of such changes.

5. Enumerate the officinal plants of the Order *Compositæ*. Describe the botanical characters of the flowers of *Anthemis nobilis;* and state how they may be distinguished from those of *Matricaria Chamomilla* and *Matricaria Parthenium.*
6. What are the distinctive characteristics of Monkshood and Horseradish roots? Give the botanical names of the plants which yield them, the Natural Orders to which they respectively belong, and state their properties and the sources of their activity.
7. Describe the physical characteristics of *annulated*, *striated*, and *undulated* Ipecacuanhas; mention their botanical and geographical sources, and to what alkaloid or other substances their medicinal properties are due.
8. Give the essential characters of the following Natural Orders, and enumerate the officinal plants which they respectively contain:—Ranunculaceæ, Papaveraceæ, Rosaceæ, Cucurbitaceæ, Scrophulariaceæ, Euphorbiaceæ, Liliaceæ, and Graminaceæ.

VIVA VOCE EXAMINATION.

Besides the above questions, the following plants were submitted to the several competitors, who were required to name them, to state the natural orders to which they respectively belonged, to mention their medical and economic properties, and to describe any peculiarity they might present worthy of notice:—

Aconitum ferox—Actæa spicata—Althæa officinalis—Epilobium angustifolium—Ecbalium officinarum—Chærophyllum temulum—Coriandrum sativum—Centranthus ruber—Tanacetum vulgare—Anthemis nobilis—Matricaria Chamomilla—Origanum vulgare—Lavandula vera—Marrubium vulgare—Gentiana asclepiadea—Solanum nigrum—Hyoscyamus niger—Symphytum officinale—Polygonum Bistorta—Fagopyrum esculentum—Mercurialis annua—Veratrum nigrum—Crinum capense—Funkia ovata.

The medal and certificates were awarded as follows:—

MEDAL ....Michael Carteighe.
CERTIFICATES OF HONOUR...John Watts.
" Charles Umney.
CERTIFICATE OF MERIT ......Jonathan Phillips.

PRACTICAL CHEMISTRY.

Dr. ATTFIELD said, that although he could not speak from many years' experience in teaching Pharmaceutical students, he had had much experience with chemical pupils, and he had never taught a class with so much pleasure as that which he had during the past year. As this was the first time for many years that a prize in Practical Chemistry had been given in the school, he would read the questions which had been submitted to competitors in this examination, and it would be seen that every one was essentially practical. Each of the competitors had answered all the questions, and deserved praise; but the one who had been most successful, and who richly deserved the honours he had attained, was one who had been most popular with his fellow-students, and who had gained the Junior Bell Scholarship of the past session. Dr. Attfield then addressed himself to the prize-men of this and past sessions, and he asked them how they would sustain their position in the future, and prove themselves fair botanists and chemists so far as related to pharmacy. He affirmed that pharmacy was not merely a trade, but that the large amount of knowledge required for its pursuit had gained it the position of a profession. He asked them to sustain the true position of the profession. Dr. Attfield added, there were several students here for the first time; he would say one word to them. He would urge them not to attempt too much at once. He deprecated the cramming system altogether. Crammed knowledge was like crammed food, which, with-

out sufficient mastication, never permanently satisfied hunger. The knowledge acquired might remain in the memory sufficiently long to satisfy an examiner, but it afterwards escaped the student, and he could not sustain the position to which he formerly pretended. He earnestly urged them to avoid so great a mistake.

The questions and awards were as follows:—

1. The solution given to you may contain any of the ordinary metallic salts used in medicine; analyse it, and state the result.
2. The accompanying "powder" is also a mixture of common metallic salts; examine it, and state the result.
3. You are furnished with an organic mixture, which you may regard as a "vomit" suspected to contain one of the following poisons:—mercury, arsenic, antimony, lead, copper, oxalic acid: which is present?
4. A specimen of "urine" is supplied to you: is there any sugar or albumen in it?
5. Determine the percentage of real acid (HCy) in the "Hydrocyanic acid" placed in your hands.
6. You have a substance labelled "impure precipitated Sulphur;" what is the nature of the adulteration, and how much is present?

MEDAL	Charles Umney.
CERTIFICATE OF HONOUR	Henry Anthony Peele.
CERTIFICATE OF MERIT	John Bourdas.

At the conclusion of the reports of the different classes, the Chairman presented the medals and certificates to the successful candidates. In doing so, he highly complimented them upon their well-merited success, and hoped that the honours they had now so well earned would urge them to further exertions. He trusted that they would in their future careers be blessed with health and prosperity, and, by their exertions, do all they could to raise the status of the Pharmaceutical chemist.

PEREIRA MEDAL.

The VICE-PRESIDENT said he had great pleasure in handing the Pereira Medal to Mr. Carteighe, who had already appeared twice before them that evening as having honourably acquitted himself at the sessional examinations. He hoped it would not be the last meeting at which he would present himself, but that he would add to the honours he had already gained by contributing matter of interest and profit on future occasions.

The questions for the written examination were as follows:—

CHEMISTRY AND PHARMACY.

1. Describe the production of essential oil of Almonds and essential oil of Mustard, explaining the changes which occur, and the characters, chemical composition, and properties of the products.
2. Describe the preparations of Antimony ordered in the London Pharmacopœia, giving the processes for their production and explaining the decompositions that occur.

BOTANY AND MATERIA MEDICA.

1. Distinguish between Parenchyma, Prosenchyma, and Vascular Tissue, and mention the parts of the higher plants in which they are respectively found.
2. What is the Seed? Describe briefly its structure and mode of germination, and state the differences between the germination of Acotyledonous, Monocotyledonous, and Dicotyledonous plants.
3. Describe the two plants before you in English; and state the Natural Orders to which they respectively belong.

4. Describe the botanical source and general characters of officinal Camphor, and state how it may be distinguished from both Dryobalanops and artificial camphors.
5. Describe the physical characters of Russian, East Indian, and English Rhubarbs; mention, as far as is known, their botanical and geographical sources.
6. Give the essential characters of the following Natural Orders, and enumerate the officinal plants which they respectively contain:—Malvaceæ, Solanaceæ, Atropaceæ and Melanthaceæ.

Pereira Medal .... Michael Carteighe.

PRIZES FOR HERBARIA.

Professor Bentley said that during the last two or three years some good collections of plants had been sent for competition, but he had had to regret the small number of students who had competed. He was led to believe that the fact of the Prize Herbaria becoming the property of the Council was the cause of the diminished number of competitors. The Council, therefore, had determined last year that in future it should be optional with the collectors whether they would leave their collections in hands of the Council or receive them back. The good effect of this alteration had already shown itself, as, whereas last year only one medal was awarded, on this occasion three prizes were given, and four collections had been sent in. This would show that the return of collections, upon which much value was placed by the owners, affected the number of competitors. The collection which had gained the Silver Medal was that of George Harrison, a registered apprentice of the Pharmaceutical Society residing at Sheffield. It was now in the room for inspection, and contained altogether 548 species. It was due to Mr. Harrison that the meeting should see with what neatness and accuracy it had been arranged. Altogether, Professor Bentley said, it was most creditable to Mr. Harrison, and showed what an industrious and persevering apprentice could do when he had the opportunity afforded him. He did not say that it was free from errors of naming, but these errors were just what might have been expected from a young botanist, and proved to him that it was a *bonâ fide* collection. He hoped that Mr. Harrison would appear again before them in a future year as a successful candidate at the Sessional Prize Examinations. The second collection in order of merit was that of Edward Morell Holmes, an associate of the Pharmaceutical Society residing at Devonport. Mr. Holmes was already favourably known as a distinguished student in our school. To this collection the Council had awarded a Bronze Medal, a distinction which its merits amply deserved, for in point of numbers it was nearly equal to the first. Great credit was due to Mr. Holmes. The third collection in order of merit was that of Henry Medd, a registered apprentice of the Society residing at Helmsby, Yorkshire. To this the Council had awarded a Certificate of Honour. It contained 450 specimens. Mr. Medd entirely deserved the honour he had acquired.

In conclusion, Professor Bentley stated that these Herbaria prizes had fully answered the purposes for which they were originally offered by the Council, for they not only encouraged the study of Botany by apprentices, but he had frequently observed that those who gained these prizes were afterwards distinguished students of the school. Professor Bentley said, that the Council would be glad to retain the competing Herbaria for inspection for one month, to remain in the care of the Librarian. He thought that the owners would readily agree to this request.

The medals and certificate were awarded as follows:—

Silver Medal............................ George Harrison.
Bronze Medal .... Edward Morell Holmes.
Certificate of Honour .... Henry Medd.

JACOB BELL SCHOLARSHIPS.

The VICE-PRESIDENT said he had great pleasure in announcing the award of a Junior Bell Scholarship to Mr. John Watts. As no competitor had appeared for the Senior Scholarship, the Council had taken into consideration the merits of Mr. Pasmore's answers in the examination, and had awarded him also a Junior Scholarship. He wished both the scholars hearty success in their future studies.

Dr. EDWARDS, as one of the Board of Examiners, had great pleasure in saying a few words on the Bell Scholarships. The Professors had evinced great pleasure in the discharge of their duties, and he, in referring to the Bell Scholarships, could not omit saying a word on the man for whom they had been instituted as a memorial, and whose bust, beautifully executed by Mr. Butler, was before them, as a generous present from their Vice-President. The memory of Jacob Bell would be regarded with feelings of reverence as long as the Society existed He was the founder of a co-partnership which had sent men abroad in all directions to sow the seeds of progress. His memory was not confined within those walls, it existed also in the hearts of those who had sprung up from the seed which he had sown all over the country; and if they wanted to see the green spring-blade which indicated hope of the coming harvest, they must go to where Jacob Bell had been, to the spots where he had sown the seed, and see what a promise of future fruit had arisen. He had lately visited Newcastle for the purpose of being present at the Pharmaceutical Conference. And in reference to this he would say that the idea of Jacob Bell as regarded progress was not confined to the success of the School of Pharmacy, but it also extended to the raising of the body of Pharmaceutists as a class. They could not make all their body metropolitan, but they must go forth and find their brethren in their own districts, and welcome them. A few of Jacob Bell's old friends met at Newcastle during the sitting of the British Association, to follow up his work. They met where he had gone years ago to speak words of kindness to country druggists, and where the seeds then sown were beginning to spring up. This conference was itself an affecting memorial of Mr. Bell, for his life had been spent in the same object for which they had then met together. He (Dr. Edwards) was led to count the number of miles the members had travelled who had attended the Pharmaceutical Conference, and he found that it amounted to nearly 5000 miles going and returning, in addition to which was the cost of leaving business and travelling. The Conference was a great attraction, but he trusted that all who had met there, met, not for political, not for trade interest, but for the advancement of knowledge. The men who had met together were the sons of the Society, and but for the journeys of Mr. Bell they would never have met at all.

The Council had with the largest liberality interpreted the endowment of the Bell Scholarships. Men were not always ready to prosecute their studies beyond a certain point; there were difficulties of age and circumstances, and oftentimes men were about to commence business, so that there was less demand for the Senior than for the Junior Scholarships, which were awarded to younger men, who had more time before them. The Council had therefore determined to confer (if sufficient number of qualified candidates presented) two Junior Scholarships, when no competent candidates offered for the senior. He hoped the gentlemen who had gained the Scholarships, and all who were present, would be deeply imbued with the spirit of the late Mr. Bell. He invited them not to be content with reading the current numbers of the 'Pharmaceutical Journal,' but its earlier ones also. They deserved perusal and reperusal. They would read there what Pereira had done. They would also find there masterly articles by the editor, on education, and all matters affecting the interests and welfare of

the Society. The interests of the Society should be uppermost in the minds of the students. They should go forth imbued with the spirit of progress and science. Dr. Edwards hoped that they would not leave the room without looking upon the bust, and thinking of him who had left so large a mind behind—left it in the midst of his days, and who had left behind him a memory which would not soon be forgotten by those who were so much indebted to him.

JUNIOR BELL SCHOLARSHIP.

The questions at the Written Examination were as follows:—

ENGLISH COMPOSITION.

1. Write upon one of the following subjects:—Chemistry, its history and uses. Railways, War.

ARITHMETIC.

1. Why is Proportion called the Rule of Three?
2. If a servant's wages be 25 guineas a year, how much has he to receive for 87 days' service?
3. If four workmen can earn £5. 12*s.* in six days, how much will their master have to pay them for 305 days at the same rate, and how much will each man's income be?
4. Reduce $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{16}$, to decimals of the same value.
5. Divide 1·7154 by 1·5.

LATIN.

1. Give the perfect tenses of the verbs Esse, Amare, Monere, Legere, and Audire.
2. What are Deponent verbs, and how are they conjugated?
3. What are the peculiarities of Defective verbs?
4. From what are Adjectives derived? state their suffixes.
5. Translate 'Cæsar's Commentaries,' Book II., from "Quum Cæsar esset in citeriore," etc., to the words "eam rem in imperio nostro."

CHEMISTRY AND PHARMACY.

1. What are the specific gravities of Rectified Spirit, Proof Spirit, Water, and Oil of Vitriol?
2. What is the proportion of Sugar in simple Syrup?
3. What is the composition of Water, and how is its composition determined?
4. What is the colour of pure crystallized Protosulphate of Iron? What is the cause of the change of colour which this salt sometimes undergoes when exposed to the air, and how may such change be prevented?
5. For what purpose is sugar used in Saccharine Carbonate of Iron?
6. How is extract of Jalap prepared according to the London Pharmacopœia?

BOTANY AND MATERIA MEDICA.

1. Distinguish between organs of Vegetation or Nutrition, and organs of Reproduction, and arrange the different organs of plants under these respective divisions.
2. Define a Stem, Root, Rhizome, Corm, Tuber, and Bulb.
3. Mention the parts which are visible to the naked eye, upon making a transverse section of a Dicotyledonous stem.
4. What plants yield black and white Hellebore; and to what Natural Order does each belong.
5. What are the officinal kinds of Aloes? State their leading distinctive peculiarities.
6. What are the officinal plants of the Natural Orders *Cruciferæ*, *Malvaceæ*, and *Polygalaceæ*?

The following Associates were elected Scholars:—

1. JOHN WATTS.
2. FREDERICK RICH PASSMORE.

Mr. CARTEIGHE begged to say a word in reference to the Pereira Medal. He thought that there were few present who really knew that the medal was com-

peted for by those students who, during the session, had passed the Major Examinations with honours. He thought it was not consistent to institute competition between men who were in an unequal position. He had no doubt that all would admit that the student who passed with honours early in the session had not a fair chance against one who passed near the end, and close upon the competitive examination. In the one case the mind was freshly stored with knowledge; and in the other, some months must have elapsed, and perhaps the onerous duties of a business entered upon. It was possible that those students who were thus prevented competing passed the best Major Examination, and he thought that the fairest way would be to forego the competitive examination, and award the medal to the Major Associate who took the highest number of marks in the examinations during the session.

Dr. EDWARDS was glad to inform the meeting that the Council had that day decided to award the Pereira Medal to the Associate who should take the highest number of marks in the Major Examination during the session; it would thus be seen that the wishes of the students had been anticipated. They had also decided upon giving a collateral prize of books, to the value of £2, in the Minor Examination, to those who passed the best examination in Reading of Prescriptions, Practical Dispensing, and Pharmacy, during the session. This would offer a fresh stimulus to the students.

Mr. RADERMACHER said he felt great pride, as an individual, and as a member of the Society, in being present at the award of the honours to Mr. Carteighe. As his late apprentice, Mr. Carteighe deserved honour at his hands, and he felt great pleasure in testifying to the uniform consistency of Mr. Carteighe's conduct while with him. His punctuality, attention, and method of making the best of his time, were patterns for all students. He wished that the relations between masters and apprentices might always be pleasant and profitable as those had been between himself and Mr. Carteighe.

PRESENTATION OF BUST OF THE LATE MR. BELL.

The VICE-PRESIDENT said it was with feelings of pleasure, mingled with regret at the loss of his late friend Jacob Bell, that he redeemed his promise, made some twelve months since, of presenting to the Society the marble bust now before them. Dr. Edwards had so well depicted the services of the late Mr. Bell, that he would only remind them that in carrying out the objects of the Society Mr. Bell strove to promote *unanimity* amongst its members, and he (Mr. Hills) never saw that feeling better exemplified than on the present occasion; he trusted that in the future working of the Society, should any differences arise, they would look on that bust, and remember the watchword of the man it represented, and then the objects of the Society would be served. The Professors had given them most encouraging reports, and he hoped that those who had already derived advantages from the school would induce others to follow their example. He thought that the difficulty of the examinations had been somewhat exaggerated. If not to be obtained in any other way, one hour a day well spent—stolen from the hours of sleep—one hour's earlier rising in the morning, would prepare the industrious apprentice to present himself for the Minor Examination. He knew that the duties of the pharmaceutical chemist were very heavy and responsible, but he was amply repaid by the position gained. He would not have them forget that it was possible to pass the Minor Examination without entering the Laboratory, but he hoped that all who had the power would take advantage of the facilities of study provided by the Society: their success, however, entirely depended upon their persevering industry.

Mr. BOTTLE said that he rose, on behalf of the Society, for the purpose of

moving a vote of thanks to Mr. Hills for his gift of the beautiful bust of the late Jacob Bell. Nothing could exceed the faithfulness of the likeness and the purity of the marble. He well remembered when he was first elected to sit upon the Council. He came there as the representative of individuals who believed that Mr. Bell had other interests than those of the Society at heart; but he had not sat long as a member of the Council before he discovered how much Mr. Bell had been belied by some who were outside the Society. It was always a pleasure to know Mr. Bell, and he became a convert to the belief that he was a great benefactor both to this Society and to society at large. He hoped that the feeling which had animated their founder would be carried down to the latest generation of Pharmaceutists.

Mr. Burden felt great pleasure in seconding the vote of thanks to Mr. Hills. The name of Jacob Bell was well known in connection with the Society. It was but a short time ago, when applying for exemption from service on juries, that an irascible judge, irate at losing a juror, exclaimed, "That's a bill that Jacob Bell got for that Society." He felt great satisfaction also at the number of prizes presented that evening. It was very encouraging to the old members to see the young men thus coming forward. Thirty years ago this state of things was entirely unknown. His early experience of pharmacy had been toil and profit, profit and toil, and oftentimes something worse, from morning to night. What he was taught was, how to make cheap preparations, and to sophisticate drugs with dexterity. What he learned of chemistry and botany came from books picked up at some old book-stall, though how he ever found time to read them, he could not say. Before these young men there was a good prospect, for they had many aids which he had never possessed, and the assistance to be derived from the Society in affording them an opportunity of gaining a sound practical and theoretical knowledge of those sciences which were intimately connected with their daily pursuits.

PROVINCIAL TRANSACTIONS.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Annual Meeting was held at the Royal Institution, on Thursday evening, September 24th, 1863; the President, John Shaw, Esq., in the Chair.

The President, regretting he had not the usual agreeable duty of presenting a prize to the Laboratory Students, called upon Mr. H. Sugden Evans, acting for the Hon. Secretary, Mr. A. Norman Tate, to read the Annual Report of the Council, as follows:—

Annual Report.—In presenting their Annual Report, your Council have much pleasure in congratulating you upon the continued prosperity of the Society. The Liverpool Chemists' Association has reached the fifteenth year of its existence, and is now one of the recognized scientific institutions of the town. The past year has witnessed a growth in the aggregate of its members, and its finances are in a highly satisfactory condition.

During the session which has just terminated, the general meetings have been well attended, and many subjects of considerable interest have been discussed. Your Council desire to encourage the introduction of short and informal communications, especially from the younger members, with the view of eliciting discussion upon a variety of subjects, which may prove both interesting and instructive. Your Council, after mature consideration, decided not to hold a Conversazione during the past Session; but arrangements were made and successfully carried out for an Excursion to Runcorn Gap, and a numerous party of members and their friends proceeded to that place, and made a tour of the Works of Messrs. Charles Lambert and Co.; J. Knight and Co.; Gaskell, Deacon, and Co.; John Hutchinson and Co.; and N. Gossage and Sons, where they were afforded an opportunity of inspecting several important chemical processes, and on their return visited the Garston Salt Refinery. The Council desire to record their thanks for the liberal spirit in

which they were met by the proprietors of the several works, and for the courteous reception and explanation of the processes by principals and managers. The excursion was agreeably terminated with a dinner at the Garston Hotel.

Your Council have much pleasure in announcing that they have received, from several exhibitors at the late International Exhibition, a large number of specimens of various articles of interest to the Society. These are at present in the museum, and will be placed on the table at the first general meeting of this session.

The Librarian, Mr. J. Scoffin, reports a decline in the numbers using the Library during the past session, which your Council trusts may have arisen from no other cause than the temporary inconvenience attending its removal; but as many valuable proposed additions to the Library are now under consideration and will shortly be announced, they trust the demand for books will increase.

Meddlesome legislation in reference to the sale of poisons has been again attempted during the past year, but the Act, which has been passed in reference to the sale of poisoned wheat, is not likely to affect the general interests of the trade. The proposed change in the legal weights and measures of Great Britain is *highly* important, as affecting the dispensing of medicines, as well as the general convenience of the country. The preponderance of opinion, after very careful inquiry, appears to be in favour of the French metrical system, already in general use among analytical and manufacturing chemists. Any change, however, affecting the weights used in the compounding of medicinal substances, should be very gradually introduced; and to avoid fatal errors, *new values* should, *in all cases*, be expressed by *new denominators*. Your Council look forward to interesting discussions on this subject during the evening meetings of the present session.

A Pharmaceutical Conference was held at Newcastle, on the occasion of the visit of the British Association to that place. It was attended by gentlemen from various parts of the country interested in the progress of pharmaceutical science, and a Society was formed, which is to meet annually in one or other of the large towns of the United Kingdom, with the object of promoting friendly re-unions and increasing the facilities for the cultivation of pharmaceutical science. Your Council anticipate that the new Society will be productive of much good. The next meeting will be held at Bath, at the time of the meeting of the British Association at that place.

The Financial Report will be laid before you by the Treasurer, from which you will observe a balance to the credit of the Society amounting to £40. 6*s.* 5*d.*, and the judicious appropriation of that sum will engage the early attention of your Council.

The President, in moving the adoption of the Council's Report and Treasurer's Financial Statement, congratulated the Society on the highly satisfactory state of the finances, and intimated that the Council would devote a portion of the handsome balance towards the addition of books to the Library. He explained the cause of the falling off in the use made of the Library, to arise from the fact of its removal during the Session, and the consequent temporary ignorance of its whereabouts by the members.

Dr. J. B. Edwards seconded the motion, and in so doing, referred to the Pharmaceutical Conference held at Newcastle-on-Tyne, and indicated the great value likely to accrue from these annual gatherings, the object of which was to discuss, and suggest for discussion, subjects of the highest interest to pharmacy. He, at some length, urged the importance of pharmaceutical education, and intimated that the Council of the Pharmaceutical Society had in contemplation arrangements for the holding of Local Examinations, if a sufficient number of applicants presented themselves in any one district to warrant the expense of taking the Board of Examiners into the provinces; and he hoped the young men would be eager to avail themselves of the opportunity, and that Liverpool would be the first town in which a Local Examination of the Pharmaceutical Society should be held.

The following resolutions were also adopted:—

"That the Report and Financial Statement now read, with the Proceedings of the Society during the past Session, and the Bye-Laws and Catalogue of Books in the Library, be printed and published."

"That the best thanks of the Association be given to those gentlemen who have lectured or read papers at the Meetings, and to the donors to the Library and Museum during the past Session."

"That the thanks of the Association be given to the Officers and other Members of the Council, and especially Mr. A. Norman Tate, for their services during the year."

Messrs. S. Banner, J. B. Edwards, C. Jones, and C. Higgins, were elected Members of Council, in the room of the members retiring by rotation.

Mr. A. Norman Tate's resignation having been accepted by the Council, Mr. M. Murphy was elected in his place.

The following gentlemen were duly elected Members:—Messrs. W. J. Baker and Buckley.

With a vote of thanks to the Chairman, the business terminated.

First Meeting of the Fifteenth Session, held at the Royal Institution, October 8th, 1863; the President, John Shaw, Esq., in the Chair.

The following gentlemen were elected members:—Messrs. R. H. Davies, W. Taylor, C. H. Thomas, W. V. Ford, J. Cartwright, W. Moysey.

Several donations to the Library were announced.

The President proceeded to deliver the opening address of the session:—

Gentlemen,—Twelve months have now passed away since I had the pleasure of addressing you at the first meeting of last session. These periodical recurrences should produce a salutary effect upon each of our minds, impressing upon us the great and important fact that our existence here is transitory, and perhaps very limited; and as time has often been represented as having a money value, especially to those who are dependent upon their own exertions, mental or physical, a duty devolves upon each of us of making the best use of every hour that may be given. At the request of your Council, I have again taken upon myself the duties and responsibilities of President of the Chemists' Association for another year, and I would here beg to acknowledge the kindness and courtesy which I have uninterruptedly received at your hands during the year that is past.

Having very recently occupied your time on two occasions, on which I have adverted to various subjects more immediately connected with the objects of our Association, I shall this evening beg to make a few remarks on the trade or profession to which the greater part of our members belong, namely, that of chemist and druggist. I am induced to do this from the circumstance that at our Annual Meeting, held a fortnight ago, a diversity of opinion was expressed as to the desirability of legislation as applied to all persons carrying on the business of a chemist and druggist, or small shopkeepers retailing drugs, chemicals, or pharmaceutical preparations; an opinion was also expressed that the late Jacob Bell, Esq., was not an advocate for such interference. This I was rather surprised to hear, for in the 'Pharmaceutical Journal' I find him saying—"That an Act of Parliament is the ultimatum which has always been in prospect as the only means by which permanence could be given to an organization of chemists and druggists for the regulation of the affairs of that body, and the advancement of the art of pharmacy;" and in speaking on another occasion, he says: "This society" (that is, the Pharmaceutical), "which was incorporated by Royal Charter in 1843, was entirely of a voluntary character; its powers did not extend beyond those who thought proper to come within its ranks, and only those young men who desired to distinguish themselves came forward for examination; consequently, the influence of the Society, *numerically*, on those entering the business was small, while the result of the system of education and examination in the cases of those who availed themselves of it, afforded satisfactory evidence of its efficacy. It was therefore necessary, in order to extend that beneficial influence, to increase the powers of the Society, and for this purpose the Pharmacy Bill was introduced. The Bill confirmed the Charter of the Society. It then enacted that it would be unlawful for any person to assume the name of Pharmaceutical Chemist, or Chemist and Druggist, etc., unless he had passed the prescribed examination, as a guarantee to the public that he was qualified to perform the responsible duty of dispensing medical prescriptions; and although it might be proved, perhaps, that a very large majority were well qualified for their business, this did not invalidate the imputation, as it still remained an open question whether qualification was the exception or the rule; consequently the whole suffered on account of the delinquency of those who, if a salutary law had existed, would not have been allowed to assume the name of chemists." And in reference to the Act obtained in 1852, he says that "it was not of that compulsory character which they had originally desired." The interference with the sale of a few simple medicines by grocers, oilmen, and small shopkeepers in country

places, although to some extent desirable, could not be conveniently legislated for; consequently they were exempted.

My object therefore this evening is to advocate the desirability, and also the necessity, of compulsory education, and examination of all chemists and druggists as a principle; and if we want a proof of the advantages arising from such a course, we have it in the fact of its existence and beneficial effect in the medical as well as several other professions. Prior to the Act of 1815, when no efficient supervision was exercised, by Act of Parliament or otherwise, over the apothecary or chemist of that day, and when education and examinations were entirely voluntary on the part of young men who intended following the profession, it followed as a matter of course that numbers would commence business with anything but an efficient amount of professional knowledge, and the result would neither be creditable to the practitioner nor advantageous to the public. Hence the necessity for enforcing education and examination; and these examinations, instituted by the Act of 1815, were, I believe, productive of the greatest good.

When the late Sir Astley Cooper was examined before a Parliamentary committee thirty years ago, in reference to the laws which regulated the medical profession, he expressed himself strongly as to the necessity of enforcing them. He said, "If examinations are not enforced, the profession will never be a profession of much usefulness. The apothecaries have done good service to their country by getting their Bill enacted;" and he continues: "When I began to teach the profession, I used to lament that there were no enforcing examinations; education was left to accident, and the result was that it was very difficult to make the pupils attend with any degree of regularity. But as soon as the Apothecaries' Bill was passed, all began to feel that by being idle they might be a disgrace to themselves and their families, and they then studied intensely; and I do very much attribute to the Apothecaries' Bill the great improvement the general practitioner has undergone in the last eighteen or twenty years."

Now this was the opinion of an eminent surgeon of the advantages of examination resulting to his professional brethren. The chemist and druggist of the present day seems to occupy something like the same position that the apothecary formerly did, with this exception, that he cannot visit and prescribe for patients. With regard to the apothecary, many years ago he emulated a higher position than the mere preparing and dispensing of medicines. Ambition and interest, those powerful incentives to valorous action amongst all classes of the community, took possession of his mind, and to the business of the apothecary he attached the profession of the physician, and the Act of 1815 secured him the enjoyment of that position.

With respect to ourselves, it is true a step has been made in the right direction by the Act of Parliament granted to the Pharmaceutical Society; but so long as the examinations conducted by that Society are entirely voluntary on the part of those who present themselves, it will never be productive of the good which a compulsory Act would establish. And here I am ready to admit, as before stated, that a very large majority of those in business at present are fully competent for all the duties of the dispensing-counter,—perhaps the minority may be very small indeed, but still sufficient to produce mischief occasionally, and bring discredit on the whole trade. I am not going to suggest any of the probable causes of the occasional inefficiency of medicine, or enter into any statistics as to the accidents that have taken place either from incompetence or otherwise, in order to establish a good case for what I am advocating, because I believe that a very large majority of the trade admits its desirability. I will however mention one case in point which occurred only a few months ago. An advertisement appeared in a Manchester paper intimating the want of a competent dispensing assistant. Amongst a number of applications for the situation was one from a person residing in a populous district in Lancashire, which I will read to you.

"Dear Sir,—Your advertizment came under my notice this morning, for which I beg leave to offer myself as a candidate. I am in buisness myself as druggist, etc., but owing to the great depression in the cotton-trade, I can with confidence leave my place to the managment of the famiely. This may seem strange; should you faveour me with an intervew, I can explane all. Wages I leave entirely with you—only don't be afraid of giving me too little, if wages be a great object. I will come for my board until you see wether I shall suit you or not. I am 30 years, married, with three children. Testimonials: Mr . Give me a trial.

[Unknown.] "Yours truly, ——."

Three persons are named as references ("testimonials" is the word used).

Now, here we have evidence either of misfortune, or perhaps something worse. But far be it from me to cast any ungenerous reflections on any who, like this person, have been perhaps reduced by the hard hand of misfortune to the cruel necessity of abandoning wife, family, business, and home, in order to eke out an existence, a mere existence, with a stranger. We are all aware of the fearful amount of destitution which has been occasioned by the want of that staple of our manufacturing industry, cotton, in consequence of the war which has been devastating the American continent during the last two years, and which, unfortunately, continues to rage as fiercely as ever; and this circumstance must have seriously crippled the resources of those tradesmen who were patronized chiefly by the cotton operatives. But we have to note almost the entire absence of even the common rudiments of education, and that is more immediately the subject which engages our attention to-night. The writing is bad, and the orthography is seriously at fault, and the wording of the letter is not of that business-like character which might be expected from one in his position.

Some persons may possibly suggest that although this applicant's education appeared defective, he yet might understand the practical part of his business tolerably well; but this is hardly probable, considering that ours is a trade which necessarily involves almost the constant use of the pen, the reading of formulæ, prescriptions, and books treating on the various branches of our business, as botany, chemistry, Materia Medica, pharmacy, etc. Now, I should imagine that there will not be a difference of opinion as to the desirability of some effectual means for preventing persons of this class engaging in the responsible duties of our profession; and I presume there is no gentleman here present who would feel perfectly satisfied with our brother-chemist alluded to above, preparing and dispensing any medicine, either for himself or any member of his family; and possibly some may say that they would never think of engaging such an assistant. That may be true; but there are others perhaps who do not draw their income from aristocratic localities, or even from the middle classes of the community, who might not be so scrupulous. And besides, we have evidence in the letter that he is already in business on his own account, and therefore patronized by some of her Majesty's subjects; and as the law of this country recognizes the value of the peasant's life as equal to that of the peer, I think that the poor should not be forgotten by the advocates for free trade in physic.

In this age of progress and improvement, the subject is one which assuredly will not be allowed to rest; its accomplishment, I believe, will be merely a question of time. I certainly cannot understand why, if the physician and general practitioner be required to prove their competency to prescribe medicine, the man who prepares and dispenses that medicine should not also give evidence of being thoroughly capable of performing his part. In the treatment of disease, if medicine is of any avail at all, it requires to be appropriate, according as past experience may suggest: this of course being the province of the prescriber; but it is of equal importance, if success is expected to follow, that the remedy should be definite and unvarying in its character and composition. And considering that we have to deal and manipulate with some of the most deadly substances, a thorough knowledge of their character is of the utmost importance, as offering a partial guarantee against accidents.

And if this principle of compulsory examination applies to the medical profession, why not to the pharmaceutical? There is certainly more reason that the public should be fully assured of their competency, than that the members of several other professions should be compelled to give evidence of theirs. I need not remind you that all captains and mates sailing from this or any other port of the United Kingdom, must undergo examination as to their knowledge of the laws and science of navigation before being entrusted with the command of a vessel, and the care of human life. And it seems strange that the governing powers should be so remiss in their duty, in not insisting upon proof of competency of dispensers of medicine; for when a prescription is given to a pharmaceutist to prepare, the life of the patient in a number of cases is certainly in his hands, and his responsibility is therefore quite as great as that of the physician, the apothecary, or the captain of a vessel. I am not here advocating anything like the system which obtains on the Continent, where, in addition to the examinations, the number of pharmaciens in a town or district is limited, and the charges for medicine, and other minor matters, are arranged by the Government. Such a system would not work in

this country, neither is it desirable. Some advocates for free trade in physic may perhaps say that the desirability of education and voluntary examinations is fully recognized by all, but that it is not necessary to make them compulsory and binding upon all; then I would reply that you just stop short of that particular act which crowns the whole structure, and without which the edifice is incomplete, and its object limited.

A simply permissive or voluntary examination, such as obtains in connection with the Pharmaceutical Society, may induce some young students who are ambitious of honours, and who also entertain a correct view of the responsibilities which attach to the profession, and who also may consider such a proceeding very politic in a pecuniary point of view, to subject themselves to the expense and ordeal of an examination; but the proportion who would act thus, past experience has proved would be very limited. But I am happy to say we have some gentlemen connected with our own Association who have done this. It is one thing to provide a remedy for certain grievances; but, without means are also devised for applying and enforcing that remedy, little good will result. Some gentlemen, for whose opinion I entertain the highest respect, appear to be such enthusiastic free traders that they will not sanction any legislation or control, even with physic. Now, although I am, in a modified sense, an advocate for free trade, yet I should hail the day when a compulsory examination should be the law before any young man be permitted to commence business as a chemist and druggist on his own account. And my impression is, that the practice of pharmacy throughout Great Britain will never be what it ought to be until that is accomplished.

The course which legislation has been taking during the last fifty years seems to shadow forth many future beneficial changes, both in abolishing laws which prohibit or restrict useful legitimate labour, as for instance, the excise laws on the manufacture of paper, glass, soap, etc., and also the enactment of measures tending to the good of the community, more especially in reference to their social condition; amongst which I may mention the Factory Act, the prevention of women working in mines, police organization, education, laws for the preservation of health, compulsory scientific examinations, etc. And these subjects still occupy the especial earnest attention of many statesmen, patriots, and philanthropists. The Social Science Association has popularized the study of questions of this character, and no doubt through that medium influenced and assisted the Legislature in the passing of some of these measures. Earl Bussell, when speaking on a recent occasion, made the following remark:—"We all remember the alarm which was felt by the farmers when the Corn Laws were repealed; but with respect to that subject, as well as many others, it has been a constant observation that has occurred to my mind, as years passed on, that many of our laws were made, not to prevent men doing evil, which ought to be the object of all laws, but to prevent them doing what was legitimate, and even sometimes exceedingly useful."

Now, the instances of beneficial changes which I have already given, may be taken as illustrations of the noble Earl's remark. And the discussion of these subjects is now engaging the attention of the Society formed for that especial object, namely, the Social Science Association.

Before closing my remarks I will again very briefly allude to what has been done during the past twenty years, in order to secure the great object for which I am contending. Most of you, I dare say, well recollect that a society composed of Chemists and Druggists was formed in 1841, for the purpose of advocating and enjoining education and examination upon the future members of our trade, and also for mutual protection against any invasion of our interests. An invitation, by the promoters, was issued to every chemist and druggist in Great Britain to join in the movement, and the response was exceedingly large, embracing nearly all the leading men in the trade, and the result was the establishment of the Pharmaceutical Society. That Society, under the able care and guidance of the late Jacob Bell, than whom I believe no better friend of the chemist and druggist ever existed, made every effort to carry out the object contemplated, and if all had responded, it would no doubt have been successful. Unfortunately, however, either from indifference, neglect, or perhaps on account of the few shillings which, in the form of an annual subscription, were required to meet the ordinary working expenses of the Society, a considerable number of persons did not lend a helping hand. The Society however continued its exertions, and in 1843 a charter of incorporation was granted to it, by which certain privileges were acquired. In 1852 an Act of Parliament was obtained securing further advantages to the Society. And very recently

another Act of Parliament was passed, which exempted all the members from attendance on juries. Educational arrangements under its auspices have also been in existence for some time, and have been the means of affording to a large number of students excellent facilities for studying their profession, and I am happy to say that many have availed themselves of these facilities, as is evidenced by those who have passed the examinations instituted by the Society; and the establishment of local examinations, which is in contemplation, it is hoped will offer further inducements to study. These are the fruits of the movement in 1841. It is much to be regretted that a good many viewed this effort in 1841 with so much apathy; but in order that none might be deprived of privileges enjoyed by their brethren, all who had kept aloof from the Society were again invited to join in 1843, and again in 1852, and many did so. However, a considerable proportion still remain outside the pale of the Society, the great majority of whom have entered the business during the past twenty years. It will be seen from the above short sketch, that those gentlemen who have taken the management of the Society from time to time were actuated by the most liberal motives, and on that account I very much regret that the supporters of another Society, which has been recently formed for precisely the same object, should have indulged in observations, on various occasions, anything but complimentary in reference to the Pharmaceutical Society. The object and intentions of the latter have been well understood from its commencement, and therefore if the members of the United Society are deprived of privileges which they consider due to them, they have only themselves to blame. A large proportion of the supporters of the Pharmaceutical Society have "borne the burden and heat of the day" for more than twenty years, and the small advantages already acquired should not create ungenerous criticism. When the United Society was formed, its intention and course of procedure were not clearly defined. In the second annual report, however, recently published, it is stated, that, "The public want not favoured practitioners in pharmacy, but competent dispensers, and the Legislature requires a distinction between the competent dispenser and the incompetent dealer in drugs. Chemists and Druggists then must be a registered body to be recognized. Now comes the question, How can an effective registration be accomplished with a due regard to existing interests? After mature and anxious consideration, the Committee answer, By an act of incorporation of the whole trade. They have the experience of two corporate bodies to guide them in this matter. The incorporation of the Apothecaries was complete, for it included every individual claiming to practise as an apothecary; and now the public is safe against the inroad of unqualified apothecaries, for every practitioner in that body is a registered member. The incorporation of the chemists and druggists, constituting the Pharmaceutical Society, on the other hand, was incomplete, being limited in the first instance to a few individuals; and now that the Society has been twenty-two years in existence, instead of absorbing and elevating the trade to the dignity of a profession, and supplying the public with a duly qualified body of practitioners in pharmacy, the public remains defenceless against incompetent dealers in drugs, and the Society itself is powerless by the side of the trade it professed to regenerate. Both these institutions aimed at the same object; but one has proved a success, the other a failure. The Apothecaries Company has succeeded because it respected the interest of every existing apothecary in his business, and guaranteed the qualification of every future practitioner. The Pharmaceutical Society has failed because it has not respected the interest of every existing chemist and druggist in his business, and has not guaranteed the qualification of every future practitioner, and those whose interests it has thus ignored, constitute the trade. Hence comes the necessity to begin again, and to include within the incorporation every man claiming to have an interest in his trade as a chemist and druggist. The Committee adhere to free trade, equal rights, and educational progress, as essential principles."

Referring to the above quotations, I have to observe that the public wanted competent dispensers in 1841 as much as in 1863. Registration in order to be recognized, was wanted then as well as now. An act of incorporation was also then a desideratum as well as now. And the council of the United Society say that the incorporation got by the Pharmaceutical Society was incomplete, and ask the question why is it at present powerless, and why has the Apothecaries' Company become a success? My reply is this, —A great number of the supporters of the United Society held themselves aloof from the effort made in 1841, and subsequent years, to improve the educational status of the trade; and that is the reason why the incorporation of the chemists and druggists has

been incomplete, and also that "it is comparatively powerless," although perhaps not quite so powerless as that term would imply, as witness the Pharmacy Act, and the late exemption from duty as jurymen. So that it appears the Society is on the one hand censured for not having done enough, and on the other for having done too much. The Apothecaries' Company has succeeded because the Act made education and examination compulsory; and if the Pharmacy Act had done the same, the benefit to the trade would have been now gradually and steadily progressing.

The report also says that the Committee adhere to free trade. It would be instructive to know what is understood by free trade. Is it consistent with their expressed intention, that they will not recognize any claimant to an interest in the trade of a chemist and druggist longer than six months after they have obtained their Charter of Incorporation?—also, that after such period, the future aspirant to the trade will be compelled to undergo an examination as to his abilities?—that he must serve a five years' apprenticeship, except under very special circumstances, determinable by the Committee?—that each examination fee shall be two guineas, one-half of which is to go into the pockets of the examiners?—that every chemist in business shall be charged with an annual registration fee of twelve shillings, and each assistant and apprentice a fee of six shillings. I think we can scarcely designate all this as free trade. In looking at the rise and progress of the United Society, I am afraid the conclusion at which we must arrive is this, that those persons who have in no way assisted their brethren in years gone by, in those reforms which the Pharmaceutical Society from the first advocated, and which are identical in their general character with those emanating recently from other sources, became convinced that, if no effort was made, they would eventually be the sufferers. Hence the desire to join at the prize, although they have contributed nothing towards its acquisition.

But it is to be hoped, that if it should be their lot to contribute to the maintenance of the United Society, and work for its success for twenty years without effecting all they desire, those who may have been quietly looking on, and who may not be contributing in any form to either Society, will be more considerate and self-denying, and more generous in their critiques on the acts and motives of their UNITED but unsuccessful brethren.

However, "Better late than never." Now that those gentlemen who, according to a previously mentioned authority, constitute THE TRADE, are fully alive to the demands of the public upon them as to competent dispensers, and also to the fact that the Legislature requires a distinction between the competent and incompetent dealer in drugs, we may expect that all will earnestly put their shoulders to the wheel, and endeavour to make up lost time, and along with the Pharmaceutical Society succeed in accomplishing what was wanted in 1841. There is plenty for all to do,—Pharmaceutical chemists, members of local associations like our own, and also the members of the United Society; and, in reference to the latter, I had expected that something more would have been done here, considering that upwards of twelve months ago, *four* secretaries were appointed to manage the affairs of the Society in Liverpool.

Gentlemen, I have to apologize for occupying so much of your time, considering that some interesting correspondence has to be brought before your notice this evening.

Mr. N. MERCER offered some remarks upon the address, in cordial support of the views put forth in it; and he then proceeded to read a very interesting correspondence between Dr. Inman and Professor Hamilton, on "Gaseous Exhalations, as nuisances and causes of disease."

LEEDS CHEMISTS' ASSOCIATION.

The First Annual Meeting was held in the Barristers' Room, Town Hall, Leeds, October 14th, 1863; the President, Mr. HARVEY, in the chair.

Mr. Henry Fryer, Huddersfield, was elected a Corresponding Member.

The following were elected Associates:—Messrs. Glaisyer, W. Roebuck, R. Bryer, W. Grace, and T. W. Lazenby.

The President congratulated the members upon the healthy state of the Society, which was not only solvent, but had a balance in hand. It will be seen, on reference to the expenditure account, that several of the items are unavoidable, and will not occur

again; and should the same liberal support be given by the members and associates during the current year, the Committee will be in a position to enhance the value of the Library. The President then called upon the Secretary to read the Report.

REPORT.—The Committee of the Leeds Chemists' Association have much pleasure in presenting their Report to the first Anniversary of the Society. The Association was organized at a Meeting held at the Town Hall, December 22nd, 1862. The number of Members enrolled at this and subsequent meetings was fifty-three, and of Associates fifty-six.

The transactions of the Association at its monthly meetings have been of a varied and interesting character. Papers or Lectures, illustrated by specimens and experiments, have been read, as under:—

Feb. 9, Mr. Ward, "On the Petroleum Oils of North America." Feb. 9, Mr. Reynolds, "Remarks upon a proposed new Test for Methylic Alcohol." March 9, Mr. E. Thompson, "On a Cheap and Accurate Chemical Balance.' March 9, Mr. Abbott, "On the Starch Granules, with illustrations by the Microscope." April 15, Mr. R. M. Atkinson, "On Acetic Acid." April 15, Mr. E. Yewdall, "On the Salts of Iron, and more especially on the Tincture of the Sesquichloride."

At the last ordinary meeting for the season, held May 21st, two subjects were introduced for discussion, viz. "Provincial examinations for the Minor diploma of the Pharmaceutical Society," and "The necessity of organized scientific research by means of division of labour." The monthly meetings have also afforded the opportunity of bringing under notice and inspection, new or rare specimens of Materia Medica, and various objects of novelty and practical interest.

A Special Meeting of the Association was held on the 8th of June last, at which a petition was adopted against "The Poisoned Grain Bill," and another petition in favour of the Bill then before the House of Commons, for introducing the metrical system of weights and measures. A memorial was also directed to be sent to the National Medical Council, in favour of the adoption of the metrical weights and measures of the new British Pharmacopœia. Letters were addressed, on behalf of the Association, to the Members for the Borough, on the subject of "The Poisoned Grain Bill;" and the Committee have pleasure in recording that the Bill eventually passed without those clauses which the Association had pointed out as specially objectionable.

In March last the Committee engaged a room at Mr. Haigh's Baths, 8, Cookridge Street, for the purpose of a Library and Committee room. The Council of the Pharmaceutical Society very liberally presented the Association with a complete set of the 'Pharmaceutical Journal.' Valuable donations of books have also been received from several members of the Association. The following periodicals are taken in:—'The Chemical News,' 'The Journal of the Chemical Society,' 'The Technologist,' 'The Intellectual Observer,' 'Bentham's Handbook of British Flora,' 'The Chemist and Druggist,' and 'Pharmaceutical Journal.'

Since the Library was opened fourteen volumes and several periodicals have been borrowed, chiefly by a small number of the associates. The Committee are anxious that the importance and utility of the Library should be adequately appreciated both by the members and associates. They trust the liberality of the former will continue to add to its store, and that the latter will freely avail themselves of it for study and reference. The series of the 'Pharmaceutical Journal' is a library in itself.

The Committee arranged with Mr. H. Denny, A.L.S., for a course of Eight Lectures on Structural and Physiological Botany, which were delivered weekly, commencing on Monday, April 28th, in a room at 13, Briggate, lent for the purpose by Messrs. Harvey and Reynolds. Twenty-six tickets were taken for this course, the average attendance being of course somewhat less. The President offered 'Bentley's Manual of Botany' as a prize to the associate who should pass the best examinations upon the subject of the lectures at the close of the course. There were two competitors, betwixt whom the precedence was assigned by Mr. Denny to Mr. Freshfield Reynolds. As the answers of the second competitor, Mr. Aldridge, were very creditable to him, Mr. R. Reynolds, F.C.S., has kindly supplied 'Lindley's School Botany' as a second prize. These volumes are now ready for presentation to the candidates.

The Committee have recently issued a circular to the members and associates, apprising them of the commencement for the coming session of Mr. Ward's Lectures on Chemistry, at the Mechanics' Institution. The value and importance of this course are so well

understood, that the Committee will only add that it constitutes a local advantage of no small importance to the pupils of the chemists of Leeds. The Committee trust that few of our junior associates will allow their apprenticeships to elapse without availing themselves of the opportunity of thus acquiring a sound and systematic knowledge of the science of chemistry.

Mr. E. Thompson has kindly agreed to deliver a course of Lectures on Materia Medica; of which a further announcement will be made when the arrangements are completed.

The preceding recapitulation will show that the practical and useful aims of the Association have been steadily kept in view. It has been sought, through the monthly meetings, and by means of mutual instruction, to keep abreast with the progress of improvement and discovery in our own profession. The supply of enlarged means of education to our younger friends has been solicitously cared for, and a beginning has been made, which the Committee trust will prove a vantage ground secured for future effort. If the interest of our members and associates can be sustained, and a cordial spirit of co-operation secured, the Association has a future before it of great interest and extended usefulness. In addition to those objects, the advantage of possessing an organization to enable us to give due consideration to events passing around us, and particularly to legislation proposed or attempted, in which our interests are implicated, has been illustrated by the experience of the past year. Looking to the future, all the reasons and motives which led to the formation of this Association exist in full force. The forthcoming British Pharmacopœia, the publication of which cannot be much further delayed, will afford material for elucidation and discussions at our monthly meetings. We believe that chemists in other leading provincial towns will increasingly feel bound to maintain similar organizations for the purpose of friendly union, and to enable them to contribute more effectively to those stores of professional knowledge which it is both the duty and interest of each one of us to preserve and increase. We shall all agree with the dictum of the great master of philosophy, Lord Bacon, that "every man is a debtor to his profession, from the which, as men do of course seek to receive countenance and profit, so ought they to endeavour of themselves, by way of amends, to be a help and ornament thereunto."

The following resolutions were also adopted:—

"That the Report be adopted and printed, and a copy sent to each member and associate."

"That Wednesday be substituted for Monday, as the day for holding the monthly meetings."

The Officers elected for the ensuing session are—President, Thomas Harvey, Esq.; Secretary, Mr. E. Yewdall; Treasurer, J. Land, Esq.; Librarian, Mr. Abbott; Committee, Messrs. E. Thompson, R. Reynolds, R. M. Atkinson, E. Brown, G. Reinhardt, Geo. Ward; Messrs. Haigh and Stead, auditors.

ORIGINAL AND EXTRACTED ARTICLES.

NEW AMERICAN REMEDIES.

BY PROFESSOR BENTLEY, F.L.S., M.R.C.S. ENG., HONORARY FELLOW OF KING'S COLLEGE, LONDON.

(*Continued from p.* 105.)

XIII. BAPTISIA TINCTORIA, *R. BROWN.*—WILD INDIGO.

HISTORY.—The root, rhizome, stem, and leaves of this plant, have been long and much used in North America, in the form of gargle, decoction, poultice, etc., for their antiseptic properties. They have also been regarded as emetic and cathartic in large doses, and stimulant and somewhat astringent in small doses.* Dr. Stevens, of Ceres, Pennsylvania, and others, have found a decoc-

* Barton, p. 257.

tion of the root of service in epidemic dysentery.* It has long acquired a popular reputation in like diseases. The Eclectic practitioners also use it extensively in scarlatina, typhus, and in threatened or existing mortification. Besides the use of this plant as a remedial agent, a blue colouring matter, resembling indigo, may be prepared from it. This dyeing agent is, however, very inferior to true indigo. Similar parts of an allied species, the *Baptisia alba* of R. Brown, commonly termed the Prairie Indigo, is used for similar medicinal purposes as the above in Michigan.† No mention is made of the *Baptisia tinctoria* in the United States Pharmacopœia, neither is it alluded to by any of the leading writers on Therapeutics in the States of North America.

SYNONYMS.—This plant has been variously named at different periods by botanists. It is the *Sophora tinctoria*, Linn. Sp. Pl. 534, and Reich. vol. ii. 243; the *Podalyria tinctoria*, Willd. vol. ii. p. 513; Bot. Mag. t. 1099; and Lam. Ill. t. 327; and the *Baptisia tinctoria*, R. Brown, in Hort. Kew. vol. iii. p. 5; Elliott, vol. i. p. 467: Hook. Fl. Bor. Amer. vol. i. p. 129; De Cand. Prod. vol. ii. p. 100; and of Torrey and Gray's Fl. North America, vol. i. p. 386. The last name is that now commonly adopted by botanists and by writers on Materia Medica and Therapeutics, and hence we have used it here. In common language the *Baptisia tinctoria* has been termed Wild Indigo, Dyer's Baptisia, Horsefly Weed, etc.

Etymology.—The generic name *Baptisia* is derived from βαπτω to dye, in allusion to the dyeing properties of some of the species. The specific name *tinctoria* has a similar origin. The common names of Dyer's Baptisia and Wild Indigo, are also derived, as may be at once seen, either from the dyeing properties of this species, or from the resemblance of the dye which may be prepared from it, to true Indigo.

BOTANY.—The genus *Baptisia* belongs to the Natural Order Leguminosæ of most botanists, or the Fabaceæ of Lindley. Lindley places it in the suborder Papilionaceæ, tribe Podalyrieæ.‡ De Candolle places it in the suborder Papilionaceæ, tribe Sophoreæ.§

Generic Character.—*Calyx*, somewhat bilabiate, persistent, half 4–5-cleft. *Corolla* of five nearly equal somewhat united petals; *vexillum* with the sides reflexed. *Stamens*, ten, distinct, deciduous. *Ovary* stalked; *ovules* numerous. *Legume* inflated, stalked, mostly by abortion, few-seeded. Perennial herbs, with simple or ternate leaves, and racemose flowers. Native of North America.‖

Specific Character.—*Root* perennial, from which arise several much branched smooth stems, about two feet high. *Leaves* very shortly petiolate, alternate, ternate; *leaflets* roundish-obovate or cuneiform; *stipules* minute, deciduous. *Flowers* in short, few flowered, terminal racemes, yellow. *Bracts* minute. *Calyx* 4-cleft. *Corolla* with a roundish, crenulate vexillum, obovate wings, and a keel of 2 obovate, somewhat united petals. *Stamens* nearly equal, as long as the keel. *Ovary* smooth. *Legume* on a long stalk, with boat-shaped valves. *Seeds* small, somewhat reniform.¶

Habitat.—This and the other species of the genus Baptisia are exclusively natives of North America. According to Torrey and Gray, the *Baptisia tinctoria* extends from Canada to Florida, and west to the Mississippi. It is abun-

* 'New York Journal of Medicine,' vol. iv. p. 358.

† "Medicinal Plants of Michigan," by Frederick Stearns, in Proceedings of American Pharmaceutical Association for 1858, p. 247.

‡ Lindley's Veg. King. p. 553; and Bentley's 'Manual of Botany,' p. 526.

§ De Candolle's 'Prodromus,' vol. ii. p. 100.

‖ De Candolle's 'Prodromus,' vol. ii. p. 100; Lindley's 'Flora Medica,' p. 237; and Torrey and Gray's 'Flora of North America,' vol. i. p. 383.

¶ De Candolle's 'Prodromus,' vol. ii. p. 100; Lindley's 'Flora Medica,' p. 237; and Torrey and Gray's 'Flora of North America,' vol. i. p. 386.

dant in Michigan,* and most other parts of the States of North America, growing in open sandy woods and dry barren uplands.† It flowers from July to the end of August or beginning of September. This and other species are described by Loudon‡ as "herbaceous plants of easy cultivation, and as border flowers ornamental."

Collection, etc.—The leaves, rhizomes, aerial stems, and roots, have been all employed as remedial agents as well as for other purposes. The part commonly used is the rhizome and rootlets, under the general, although improper name of root, and the bark is said to be the most active portion.§ From experiments made by ourselves, we should also regard the cortical portion as being to some extent the most powerful part of the plant, but we do not think the difference between it and the woody parts is very marked. When the leaves and the aerial stems are used, they should be collected about July, just as the flowers are expanding, at which time they are in full activity. The rhizome and roots, the parts ordinarily employed, and certainly the chief seat of the virtues of the plant, should be collected in the autumn months; or early in the spring, before active vegetation has commenced.

General Characteristics.—The part of *Baptisia tinctoria*, as just noticed, which is commonly and properly employed as a remedial agent, is generally designated as the root, but the different commercial specimens as seen and examined by us, consist of roots, rhizomes, and stems, mixed in varying proportions.

In length the pieces vary commonly from about one inch to four inches, averaging about three inches; but shorter and longer pieces may also frequently be found. In thickness they vary from about a quarter of an inch to one inch, a common size being about half an inch. In some samples many smaller pieces and rootlets may be found, either intermixed with the larger ones, or attached to the rhizomes. Some of the pieces present a very irregular twisted and branched appearance, and have numerous projections of varying length; others are nearly straight. Externally they are marked by irregular longitudinal furrows and striæ. They vary in colour externally according to their size, being yellowish, yellowish-brown, dark-brown, or blackish; more generally they have a dark-brown colour. The fracture varies somewhat in different pieces, being in some much closer than in others, but it is always more or less irregular and fibrous; particularly in the cortical portion. The pieces are very tough, and difficult to reduce to powder.

A transverse section of an average-sized piece shows a compact central woody mass or meditullium of a light-yellowish colour, surrounded by a thick brown cortical portion, the inner layers of which are tough and fibrous, and the outer somewhat of a corky character. This corky appearance is more evident in the large pieces.

Wood and Bache‖ describe the root as inodorous, but the specimens as examined by us, which have been kept in stoppered bottles, have a well-marked and peculiar odour. The taste is disagreeably bitter and somewhat acrid; that of the cortical portion is most evident, but that of the meditullium is also very evident.

Composition and Chemical Characteristics.—The only analysis of this substance with which I am acquainted, and this an incomplete one, is contained in an Inaugural Essay at the Philadelphia College of Pharmacy, by Bennett L. Smedley.¶ He found albumen, starch, resin, and a crystalline principle,

* Stearns, in Proc. Amer. Pharm. Assoc. for 1858, p. 247.
† Wood and Bache's 'United States Dispensatory,' 11th edit. p. 1374.
‡ Loudon's 'Encyclopædia of Plants,' p. 342.
§ Wood and Bache's 'United States Dispensatory,' 11th edit. p. 1374.
‖ 'United States Dispensatory,' 11th edit. p. 1374.
¶ 'American Journal of Pharmacy,' vol. x. 3rd ser. p. 310.

which may probably turn out to be a new alkaloid, as constituents of the so-called root. He could not discover the presence of any fixed or volatile oil. The medical properties of the root, he believes to exist in the crystallizable principle obtained.

An infusion of the mixed rhizomes and roots, well bruised, in the proportion of one ounce to twenty-four ounces of boiling water, and allowed to macerate for twenty-four hours, had a yellowish-brown-red colour, about that of an ordinary brown sherry, a peculiar well-marked odour, reminding one to a certain extent of liquorice, and a peculiar, slightly bitter, acrid taste. It exhibited the following reactions:—*tincture of iodine* produced an intense blue coloration, but no precipitate; *solution of persulphate of iron* heightened the colour, but produced no precipitate; *solution of perchloride of iron* had the same effect as the former, but more marked, although no precipitate was formed; *solution of baryta* caused the deposition of a plentiful, light, flaky, brownish precipitate; *solution of nitrate of silver* slowly reddened the colour of the infusion, and ultimately formed a tolerably abundant dark reddish-brown precipitate; *solution of sulphate of copper* caused a light, flocculent brown precipitate; *solution of acetate of lead* speedily caused a plentiful, light, brownish precipitate; *solution of basic acetate of lead* rendered the infusion milky, and caused the slow deposition of an abundant, light, yellowish-white precipitate; *solution of bichloride of platinum* produced a very evident brownish-black coloration, and after some hours, a plentiful brownish-bluish-black precipitate was deposited; *solution of protochloride of tin* had no evident effect at first, but after some hours' standing, the infusion deposited an evident, yellowish precipitate; *solution of chloride of lime* slightly deepened the colour at first, the colour then became slowly discharged, and a slight, white, flocculent precipitate was formed; *solution of oxalate of ammonia* produced after some hours an evident whitish, more or less floating precipitate; *sulphuric acid* had no very marked effect at first, but after some time it caused a dirty-yellowish-white, powdery precipitate; *hydrochloric acid* slightly lessened the colour of the infusion, but its effect was not very marked. No very evident effects were produced by *litmus* or *turmeric papers;* nor by *nitric* or *acetic acids;* nor by *tincture of galls;* nor by the application of either of the following solutions:—*potash*, *ferrocyanide of potassium*, *ferridcyanide of potassium*, *chromate of potash*, *antimoniate of potash*, *carbonate of potash*, *nitrate of baryta*, *sulphate of soda*, *bichloride of mercury*, *chloride of calcium*, *sulphate of lime*, *gelatine*, and *ammonia*.

By the application of *nitric acid* to the freshly cut surface of the root, a reddish tint was produced over both cortical and woody portions. *Sulphuric acid* applied in like manner rendered the different parts more evident, and the colour more especially of the cortical portion was darkened. By a like application of *hydrochloric acid*, all parts of the section became reddened, except the external bark, which was turned nearly black: the different regions were also rendered more evident. By the addition of *solution of ammonia*, no very evident effects were produced in the woody parts, but the cortical portion became much darkened in colour.

Medicinal Properties and Uses.—Wild Indigo is in much esteem by some American medical practitioners for its antiseptic properties. It has been employed on this account in the form of a gargle or wash in gangrenous ulceration of the mouth and throat, mercurial ulceration, and as a poultice applied to malignant ulcers tending to gangrene.* Dr. Wood states that Dr. Comstock, of Rhode Island, found it extremely useful, both as an internal and external remedy, in threatened or existing mortification. Dr. Stevens, of Ceres, Pennsylvania, has employed a decoction of the root advantageously in epidemic dysentery, and

* Pharm. Journ. vol. xvi. p. 271.

Dr. Thacher speaks highly of its efficacy as an external application in obstinate and painful ulcers."* The author of a notice of this drug in the 'Lancet,'† says, "The primary action of a full dose is emetic or purgative, but in smaller doses is stimulant; and its special property is antiseptic, producing, it is said, a striking change in the type of fevers, relieving the symptoms designated *pernicious* or malignant in scarlatina, typhus, and other fevers, inflammations and ulcerations of the mouth and throat. It is applied externally at the same time to foul ulcers and sloughing or gangrenous sores, and as an injection in fetid discharges from the mucous passages; in short, in all cases where there is a tendency to putrescence." Mr. Smedley states,‡ that he was induced to undertake the chemical examination of this substance, in consequence of interrogations from an old country gentleman, who had for many years been in the habit of administering it both to his own family and neighbours in the form of a strong decoction, as a most effectual cure in the early stages of dysentery. Tilden says,§ "Internally it acts powerfully on the glandular and nervous systems, increasing all the glandular secretions, and arousing the liver especially to a normal action."

Dr. Grover Coe,‖ speaking of *Baptisin*, the reputed Eclectic active principle, a resinous matter obtained from *Baptisia tinctoria* in a similar manner to that already described by us when writing upon Podophyllum and other of the New American Remedies,¶ says that it possesses "alterative, emetic, laxative, stimulant, emmenagogue, tonic, and antiseptic properties; and that it may be employed in amenorrhœa and defective menstruation, erysipelas, hepatic disorders, whenever an alterative is indicated, and in scarlatina and typhoid fevers, and in all diseases that have a putrescent tendency." The above extracts will serve to call the attention of English practitioners to those diseases in which this drug has been more particularly administered or externally applied. Mr. Smedley** says, "The active properties of the root I suppose to exist in the crystallizable principle,†† and those ascribed by the Eclectics to the resin are mainly owing to its containing a very small portion of this principle in combination." Until this principle be isolated however, and its effects specially investigated, we can know nothing of a positive character about its action on the animal system.

ADMINISTRATION, PREPARATIONS, AND DOSES.—Wild Indigo has been used both as an external application and for internal administration, principally in the forms of a decoction and the so-called concentrated preparation termed *Baptisin*.

The mode of preparing the latter we have already alluded to above, but as now imported and used, it is a very uncertain and indefinite preparation. Smedley, in the paper already noticed by us, states that he obtained a yellowish resin by making a concentrated tincture of Wild Indigo with strong alcohol, and then adding to it a large quantity of water. In this manner of operating he obtained two drachms and two scruples of resin from two pounds of the so-called root. He adds "four grains of the resin, which by the Eclectics is styled baptisin, were taken by myself, attendant with no other effect than occasioning much nausea."

The following formula may be used for preparing the decoction:—*Decoction of Baptisia tinctoria*, or *Wild Indigo*.—Take of Wild Indigo rhizome and

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* 'United States Dispensatory,' 11th edit. p. 1374. † 'Lancet,' vol. i. p. 190, 1863.

‡ Amer. Journ. Pharm. vol. x. 3rd ser. p. 312.

§ 'Chemist and Druggist,' vol. iv. p. 191.

‖ 'Concentrated Organic Medicines,' p. 220.

¶ See papers by the author, on *Actæa racemosa*, Pharm. Journ. vol. ii. 2nd ser. p. 462; and on *Podophyllum peltatum*, vol. iii. p. 461.

** Amer. Journ. Pharm. vol. x. 3rd ser. p. 312.

†† See 'Chemical Characteristics,' pp. 213, 214.

roots mixed, and well bruised, *two ounces and a half;* boiling water, *two pints*. Boil down to a pint and a half, and strain.

Of this decoction Dr. Comstock gave half a fluid ounce every four or eight hours, and any tendency it exhibited to operate on the bowels was checked by laudanum.

The dose of baptisin, according to Tilden, is from a *quarter* to *half a grain;* but Dr. Coe* says the average dose is from *one* to *three grains*. Whilst there is such uncertainty as to the strength of this preparation it would be advisable to use the decoction exclusively, or to give the doses of baptisin as marked by the several manufacturers upon their respective preparations.

SCHEELE AND HIS DISCOVERIES.

(Translated and arranged from the Memoir of M. Cap.)

BY MR. JOSEPH INCE.

Certainly not in this Journal should the life and labours of Scheele be unnoticed. His career is a bright example of how far the mind may triumph over external difficulties, and of how little value are adventitious aids when genius is linked with perseverance. To us especially as Pharmaceutists must the record be of interest, teaching, as it does, that nothing is denied to patient industry, and that the loftiest results have been, and therefore may be again within the grasp of the man who has to earn his bread by the humblest plodding behind a Druggist's counter.

Charles William Scheele was born at Stralsund, December 9th, 1742. Stralsund is a town in Swedish Pomerania, and now belongs to Prussia. He was the son of a small tradesman, burdened with a numerous family. His father placed him with a M. Bauch, an old family friend, an apothecary at Gottenburg. Apprenticeship in Sweden lasted generally six years, at the expiration of which the apprentice took the title of "garçon," and later on, that of assistant (*aide-apothicaire*). Scheele's classical studies had been painfully limited, and his first essays in Pharmacy were more painstaking than successful. He was a laborious reader of works relating to his profession, specially those of Neumann, De Lémery, De Stahl, and one of Kunckel's, called 'The Laboratory;' and he often worked out at night experiments that the day's study had suggested. One word will best describe him—diligent. After some years' stay with M. Bauch he went to Malmöe, in Scania, where he spent five years with another pharmacien, M. Kalstroem. There, in silence and retirement, he devoted himself to the deep and serious study of Chemistry. In 1767 he went to Stockholm, became assistant to M. Scharenberg, superintendent of Pharmacy, and stopped there three years; after which he went to Upsal, where Bergmann was a celebrated professor. So great was Scheele's timidity that he had not the courage to present himself before the noted lecturer, though, with the zeal of a true chemist, he had set his heart upon the introduction. Circumstances however, and the fame of some personal dexterity stood his friend; the student and the *savant* met, were mutually delighted with each other, and became sworn associates from that hour. A few months afterwards Scheele read a notice on Fluor Spar before the Académie des Sciences, and on the proposition of Bergmann, a simple student of Pharmacy was elected an Associate of the Academy. Such a distinction affected little the studious and retiring Scheele, who longed only for the quiet which would enable him in peace to pursue his studies. In vain Bergmann tried to keep so promising a man at Upsal by the temptation of a good position.

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* 'Concentrated Organic Remedies.'

In the name of the Government he offered him a Chair in the Faculty, and the direction of different manufactories. Scheele absolutely refused; but learning that there was a vacant pharmacy in a small and obscure country town, he set off for Kœping, on the Lake Malaren. He was then thirty-one years old, and while occupied in the routine duties of that seemingly unenviable position, he pondered over, and in his leisure moments successfully worked out, that series of discoveries that will for ever be associated with his name. Two years from this date, (1777) the Royal College of Medicine received him gratuitously, and dispensed with all the usual formalities of introduction. Nine years he patiently worked on at Kœping. He found the business in a languishing condition, and he succeeded in its restoration; paid the debts of his defunct predecessor, as well as created a small fortune for the widow, whom, in his less abstract moments, he meant to marry. Bergmann was his unfailing herald in the world of Science. At his suggestion the Academies of Berlin, Erfurt, and Sardinia, and the Royal Society of Medicine at Paris admitted him amongst their ranks. Just when the present seemed to give promise of the brightest future, he was suddenly enfeebled in his health. He had wished as a last point of honour to have left his name and moderate savings to the widow, but the very day appointed for his marriage he was seized with fever, which proving fatal, he died at the early age of forty-three.

The first essay of Scheele was on Tartaric Acid. It was addressed to Bergmann, who returned it to the author without the slightest comment. Hurt by this strange indifference, Scheele sent his manuscript to Retzius, Professor at Lund, who inserted it in the *Transactions* of Stockholm for 1770, but with no acknowledgment of the author. In 1771 he published his 'Examination of Fluor Spar and its Acid.' Some years previous, Margraff was engaged on the same subject, and pointed out that Fluor Spar did not contain Sulphuric Acid. Scheele, on treating it with this powerful reagent, noticed certain white acid vapours which attacked the glass. He named this product Fluo-silicic Acid. Remarking that the vessel filled with water in which it was collected was covered with a coating of Silica, he at first thought that Silica was composed of Water and Fluoric Acid; but in a second notice (1780) he recognized his mistake, and demonstrated that the Silica obtained came from the glass of the retort or else from the receiver. The ultimate result of this investigation was the admission of the radical called Fluor. In 1774 Scheele published his 'Researches on Black Magnesia,' otherwise called Manganese. He was then living at Upsal, for it was at the instigation of Bergmann that he undertook this inquiry—one of his best performances. This memoir contains no less than four discoveries which would have sufficed to have established the reputation of a skilful chemist. In the first place, he discovered that this ore combined eagerly with metallic oxides and with some acids, whence he concluded that black Magnesia had a metallic base. On treating it successively with all the strong acids, he remarked (1) That with Sulphuric Acid he obtained a white pinkish salt (Sulphate of Manganese), and that there was liberated an elastic fluid which was not fixed air, the only gas then known, but which possessed the properties of *dephlogisticated* air, being evidently Oxygen. (2) With Muriatic Acid he produced a gas of yellow colour, having an odour of Aqua Regia. Having collected this gas in a bladder, it was coloured yellow, from which he at first thought that it was Aqua Regia in a state of vapour. He then collected it in bottles filled with water, with Hales's apparatus, and he noticed that the gas corroded the corks and turned them yellow; that it bleached blue Litmus Paper as well as vegetable colours, and that during this action, in presence of water, the gas was converted into Muriatic Acid. He also established that plants once thus bleached did not recover their natural colours, neither on the addition of Acids nor Alkalis; that this gas attacked all metals. In a word, he gave an exact and

complete history of this new gas, which at first he called *Dephlogisticated Muriatic Acid*, which since has been termed *Oxygenated Muriatic Acid Gas*, and to which has been recently given the appellation of Chlorine.

A third discovery made by Scheele in studying Manganese was Baryta, with which it is nearly always associated. He showed that this new Earth, which he called *Terre pesante* (*βαρὺς*, heavy), is distinct from Lime and Silica; that it neutralizes acids, and forms with Sulphuric Acid and the Sulphates a neutral salt insoluble in water. Fused with Borax it forms a vitreous mass, which is coloured brown on the addition of a little Sulphur, etc.

Lastly, he remarked that Ammonia, treated by Nitrate of Manganese, is decomposed, producing a gas differing from Carbonic Acid, namely, Nitrogen. Considering that this dissertation on Manganese was published in 1774, and that the experiments on which it is based went back for several years, Scheele may be regarded as having been the first to discover Nitrogen Gas, which he for a long time called Vitiated or foul Air (*Air vicié ou corrompu*).

Next year (1775) Scheele read before the Academy of Stockholm his *Remarks on the Salt of Benzoin.* Up to this time Flowers of Benzoin, already recognized as an acid, were obtained by means of Sublimation. Scheele used the wet way, which gave a better and more abundant product. After boiling powdered Benzoin with quicklime, he filtered the solution and added Muriatic Acid. Benzoic Acid was precipitated in beautiful crystalline plates, of a strong odour when exposed to heat. This ingenious and convenient process has been followed ever since. (A most successful though unfortunately secret process was adopted by Mr. Fowler, of Bedford Street, Covent Garden. Since his death his method has apparently been lost. No Flowers of Benzoin with which I am acquainted are free from a certain empyreumatic odour, varying in different commercial samples, but always present.—J. I.)

The same year Scheele published one of his most important discoveries,—a paper on Arsenic Acid. He imagined that White Arsenic (*the Arsenious Acid* of Fourcroy) could take two degrees of acidity. He treated crude arsenic with Nitrous Acid, and obtained Arsenic Acid; he examined all its combinations with the alkalis and metals; he demonstrated that combustible bodies could bring it back to the state of White Arsenic, and even of metallic Arsenic. On heating it in combination with Ammonia, he obtained a gas which extinguished flame, being neither fixed air nor Carbonic Acid. This was Nitrogen. Lavoisier and Berthollet repeated his experiments, and easily explained the various phenomena described by the principles of the new theory of Chemistry. Never weary of his labours, Scheele worked on Quartz, Silica, Clay, and Alum; then he commenced his Analysis of Benzoar, in which he discovered a particular acid, first called Lithic, and afterwards Uric Acid.

These researches paved the way for all the recent investigations of Urinary Calculi, and even of Urine itself.

The same year Scheele obtained Oxalic Acid by the action of Nitric Acid on Sugar. In 1777 appeared his Treatise on Air and Fire, a work on which he had been long engaged. Whether or not he may claim to have been one of the original discoverers of Oxygen is uncertain, yet in this identical pamphlet occurs the capital experiment that when Manganese is exposed to a high degree of temperature and then heated with Sulphuric Acid, an elastic fluid is disengaged, which he named Air of Fire. Priestley had in truth announced the same fact in 1774, and Scheele, unfortunately for himself, only published his discovery when his work, which had been seven years in preparation, was complete. He established also the point that common air is composed of Air of Fire and Foul Air (Nitrogen); that the process of combustion deprives common air of its purest part (Oxygen). The same work contains remarks of the greatest interest on Nitrous Gas, on Sulphuretted Hydrogen, on fulminating Gold, and on the Radiation of Heat.

In the course of 1778 this wonderfully industrious man published four separate memoirs:—1. A process for preparing Calomel. 2. The preparation of the Oxychloride of Antimony. 3. The preparation of what is still called Scheele's Green, which was obtained on pouring a solution of Potash and white Arsenic in a solution of Sulphate of Copper. It is an Arsenite of Copper. 4. Molybdenum, whose ore was originally confounded with Plumbago. Scheele proved that it was a compound of Sulphur and a whitish powder (Molybdic Acid), from which more recently Hielm extracted Molybdenum in a state of Metal. In 1779 he continued the same subject, and showed in what manner Plumbago differed from Molybdic Acid, demonstrating that it was composed of fixed air and Carburet of Iron. This analysis was followed by *Experiments on the quantity of pure air contained in the atmosphere.* For a year he continued his observations and obtained the same results as Lavoisier, namely, that pure air (Oxygen) formed $\frac{9}{33}$rd part of our atmosphere. About the same time appeared his 'Experiments on the Decomposition of Neutral Salts by Quick Lime and Iron.'

In the Annals of the Academy of Stockholm are three published Memoirs belonging to 1780. A. Remarks on Fluor Spar, being chiefly an answer to objections to his previous paper. B. Examination of Milk and its Acid. After having stated the influence of Alkalis and Acids in determining its coagulation, he pointed out that caseine when calcined contained Phosphoric Acid and Lime. In order to obtain the Acid of Milk, he evaporated the Serum down to an eighth part, saturated it with quicklime, which he afterwards separated by Oxalic Acid; then he treated the liquor with Alcohol, which dissolved the Lactic Acid without touching the Sugar of Milk. On distilling the Alcohol he obtained pure Lactic Acid. C. The examination of Sugar of Milk. On treating the concentrated Serum with Nitric Acid he obtained Saccho-lactic Acid in crystals, or in the form of a white powder, sparingly soluble in water, and forming, with alkalis, crystallizable salts. Each succeeding year is the record of some new and original observation; but we must not linger too long over details.

In 1781 appeared the Memoir on Tungsten and his discovery of Tungstic Acid. In 1782 three new memoirs saw the light, the first being *Observations on Ether*, and the second, *A Method for Preserving Vinegar;* the third, same date, is an *Essay on the Colouring Matter of Prussian Blue.* This is one of his most important dissertations, and probably his *chef-d'œuvre.* It is divided into two parts. In the first, Scheele endeavours to discover the substance which, in Prussian Blue, is united with Iron and an alkali. The methods employed in this research are most ingenious, and show the utmost skill in the employment of reagents. By dint of repeated trial, he succeeded in discovering the colouring matter; his first description of it being that it possessed a peculiar odour, that of bitter almonds; that it had a burning taste, and produced coughing. It is strange that he did not at the same time remark its poisonous qualities. Possibly his very manipulations tended to shorten his life. In order to assure himself of its composition, he treated it successively with all the known alkalis and acids. When found, he called it simply *The Colouring Matter.* Bergmann gave it the more ambitious title of *Acidum cœrulei Berolinensis*, afterwards styled Prussic Acid by Guyton de Morveau, and finally Hydrocyanic Acid by Gay-Lussac. These experiments were subsequently followed up, Scheele continuing to study the action of this colouring matter on alkalis, acids, and metals.

He established that Prussiate of Ammonia might be entirely sublimed; that that of lime yielded its base to caustic alkalis and acids; that the colouring matter was capable of distillation. This product was used as a test for the presence of iron, and he then designated it as Precipant Liquor. In attempting the elementary analysis of Prussic Acid he at first supposed that it was

formed of Ammonia and Oil. To convince himself of this, he tried every possible mixture of Ammonia and fatty bodies, but as no resulting product gave Prussian Blue with Sulphate of Iron, he was convinced that there was no oil in its composition. He put in a crucible carbon and potash, and kept them at a red-heat, then added Sal Ammoniac, and continued the heat until no more ammoniacal vapours were disengaged. He poured the whole into filtered water, and obtained a salt (Prussiate of Potash) which gave a dark-blue precipitate with Sulphate of Iron. By further experiments he came to the conclusion that this *colouring matter* was composed of Ammonia, Inflammable Air, and of a carbonaceous substance. These three bodies—Nitrogen, Hydrogen, and Carbon, are in fact the bases of Prussic Acid.

The Annales de Chimie de Crell (1784) contain five memoirs, one being specially interesting to ourselves as Pharmaceutists—the discovery of a Sweet Principle obtained from Expressed Oils and Animal Fats. He obtained it by boiling one part of powdered Litharge in two parts of fat with a little water. This is the ordinary method for making Emplastrum Simplex. The supernatant liquor, separated by decantation, was evaporated to the consistence of a syrup. This substance, of a sweet taste, much like oil to the touch, was nevertheless not a fatty body, because it is soluble both in water and in Spirit of Wine. Exposed to a high temperature it burns, and is distilled at the same degree of heat as Sulphuric Acid. This product is not crystallizable, and does not undergo fermentation. It is needless to state that this was Glycerine, the name having been created for it by M. Chevreul. Since its discovery it has become most extensively applied in Pharmacy, though, like Chloroform, it remained for some time as a chemical curiosity.

The last research that we must notice was an attempt to obtain Citric Acid. Scheele had often been foiled in his endeavours to present it in a pure and crystallizable state. He imagined that the cause of his failure was the presence of a viscous matter in expressed lemon-juice which enveloped it. He tried at first to coagulate this matter by means of Spirit of Wine, but not being successful in obtaining crystals, he imagined that the Acid was masked by some foreign body, which he attempted to separate by mixing concentrated lemon-juice with Chalk. The filtered and washed precipitate was treated with Sulphuric Acid diluted with ten parts of water. The whole was boiled for some minutes, filtered, and concentrated; on cooling, a crop of beautiful crystals was obtained. Some of his last researches were on Acetic Ether, Benzoic Acid, and on the Preparation of Prussiate of Potash. *Some* is the only fitting term, for his life was labour, and it is doubtful whether any one man ever crowded more into so short a life. Let it be remembered, to his honour, that he was simply a working Pharmaceutist, and that he passed nearly his whole life behind a druggist's counter. We must recollect, says M. Cap, that Scheele was not a professional Chemist, a *savant* whose sole mission was the advance of science, being able to give his whole time and abilities to that end. So far from it, the moments consecrated to study were never allowed to interfere with the routine of his occupation. In the midst of the dry and necessary duties of daily life, he had to ponder his experiments and to construct his simple apparatus. His fortune was too slender to let him wander into elaborate experiment, added to which, the character of his mind forbade any but the plainest and most direct methods of investigation. He seems to have thought intently, and then to have manipulated, for which reason the intermediate steps of his reasoning are seldom given in his writings. Nothing could be more bare and unpromising than his apparatus: a common furnace, a still, a sand-bath, a crucible, sundry phials, drinking-glasses, and bladders to receive his gases, constituted the whole wealth of his laboratory. With these simple elements he recognized acids, gases, metals, and elementary bodies, and worked at transcendental Chemistry in a back shop, with a few bottles and a retort.

Scheele, to his own great personal hindrance, had never received a single lesson or followed an academical course, and being also little familiar with any other language than his own—the German—he often was laboriously engaged in preliminary details which a knowledge of contemporary literature would have spared him, and he not unfrequently repeated experiments that had already been successfully attempted. He was thus forced to be profoundly original.

M. Dumas, no mean authority, declares:—"Whenever it is a question of facts, Scheele is infallible. Scheele rose to the highest rank he could attain by work, experience, and thought, without the aid of any scientific education. Whether he could have risen higher, I know not; still, when it is commonly said that in order to work for the advance of Science, it is necessary to live in the grand University centres and not in the atmosphere of provincial life, we cannot help turning our thoughts on Scheele and Kœping." Still, it must be allowed, that Pharmacy came somewhat to his aid. Had he not been a pharmaceutist his mind would not naturally have been led to the consideration of many subjects that came prominently under his notice. Thus, Cream of Tartar suggested his first essay on Tartaric Acid, and no sooner had he devised a method by which he could isolate this principle, than he applied it to the investigation of a great number of other acids and principles analogous. Once on the right track of analysis, he studied Benzoin, Gall-Nut, Rhubarb, Orris, Asclepias, Turmeric, Ether, Milk, the fatty bodies, Salt of Sorrel, the Salts of Mercury, and many objects of Materia Medica. Indeed, he was led to his various discoveries by the exigencies of his daily life; his Pharmacy was the guide to his abstract Science.

The personal history of this great experimenter is almost whimsical in its simplicity, even when taking into consideration the plain and unostentatious living of the North. Scheele had but one passion—Science; for that he lived, and for that he had originally withdrawn himself from the stir and emoluments of city-life, that in its service he might die. It is almost impossible to match his marvellous devotion to one object, and the sincerity with which he despised wealth and honours. The King of Prussia in vain tried to have him at Berlin. The English Government offered him a post of distinction and £300 a year, both of which he refused. As we might expect, he was of a serious disposition, and spoke little. Never in a hurry, yet he was never idle, and he invariably pursued one study at a time.

In 1782 the President of Virly and M. d'Elluyart, a Spanish chemist, went on a pilgrimage to make the personal acquaintance of Bergmann and Scheele. After having seen Bergmann at Upsal, and from him obtained an introductory letter for Scheele, they went to Kœping, found the humble and learned apothecary in his shop, adorned with the traditional white apron (*revêtu du tablier traditionnel*), and busied with his ordinary work. Scheele received them most cordially, but kept at his business, and offered no excuse. He talked with them on the recent progress of Science, of his own researches, and of the discoveries of Bergmann. "He is the honour of Sweden," said Scheele to the two friends, who quite thought that he himself might share the compliment. The travellers invited him to dinner, but no sooner was it ended than he rose, went back to his laboratory, and let them follow at their leisure.

One last anecdote must not be omitted. The King of Sweden, Gustavus III., being on a tour in Italy, was present at a meeting of the Academy at Turin, of which Scheele had been elected a foreign member. Much was said of the important discoveries of the Swedish chemist, and some one asked the King (who piqued himself on knowing all the eminent men in his kingdom) how the illustrious Scheele was. "He is very well," replied the King, who, until that moment, had never heard his name. On his return to Sweden he hastened to gain information of this man, whose fame had penetrated Europe, and who was

unknown in his own country. He learnt that the great chemist was a simple apothecary in the little town of Kœping. The King wished to ennoble him, the honour was refused; the order of knighthood was nevertheless transmitted, but being addressed to a namesake, Scheele remained with no other title than that of one of the greatest chemists of Sweden, and of his age.

26, *St. George's Place, Hyde Park Corner.*

FIRST ANNUAL REPORT ON THE EXPERIMENTAL CULTIVATION OF THE QUINIFEROUS CINCHONA IN BRITISH SIKHIM, FROM 1ST APRIL, 1862, TO 30TH APRIL, 1863.*

BY T. ANDERSON, ESQ., M.D., OFFICIATING SUPERINTENDENT OF THE BOTANIC GARDENS, CALCUTTA.

The progress of the cultivation of the Cinchona at Darjeeling under my direction was fully reported to the Lieutenant-Governor of Bengal on the 6th August, 1862, and the Report was published in the Supplement to the 'Calcutta Gazette.'

That Report contained the history of the experiment from the dispatch of the plants from Calcutta on the 24th March, 1862, until the 1st August. In that Report, I stated that the experiment might be considered as having commenced on the 1st of June, as, from unavoidable delays in a district where carriage of all kinds was most difficult to procure, where skilled labour was scarce and extravagantly expensive, and where even the ordinary processes of gardening were quite unknown, I was obliged to keep the Cinchona plants confined for two months in Wardian cases, some of them having been already subjected to five months of this confinement. The total number of plants with which the experiment was commenced on the 1st June was 211. On the 1st of August, the number had increased to 1611 of all kinds, of which, however, it is deserving of note that 1300 were newly-raised seedlings of *Cinchona Pahudiana*. In the end of August, Mr. Stubbs, the European gardener who had accompanied the plants from Calcutta in March, suffered so much from continued illness of a serious nature, that I directed Mr. A. T. Jaffrey, who had just been appointed Assistant Gardener of the Botanic Gardens in Calcutta, to proceed at once to Darjeeling to receive charge of the cultivation from Mr. Stubbs, whom I intended, on his recovery, to recommend for appointment to the charge of planting the avenue of mahogany and other trees along the Ganges and Darjeeling Road. Mr. Stubbs, however, died on the 26th September at Kursiong, where he had gone for change of air. Mr. Jaffrey received charge of the experiment on the 13th September. I again submitted a Report on the 12th November, in which it was shown that the total number of plants in the Nursery was 2286, of which, however, 1921 belonged to the doubtfully quiniferous species, *C. Pahudiana*, so largely cultivated by the Dutch in Java, leaving only 365 plants as the stock of the undoubtedly valuable species of Cinchona. I made a visit of inspection to the Cinchona Nursery at Darjeeling in January. I left Calcutta on the 18th January and returned to Calcutta on the 1st February. I then saw that my fears, that the height of Sinchal above the sea and the cold of the winter would seriously affect the condition of the plants, had been confirmed, though there had been few deaths (not more than fifty of all species), yet the situation was so unfavourable that almost no cuttings or layers had been made since November. This was partly owing also to an untoward accident having happened to the flue in one of the two small propagating pits. The upper part of the flue immediately over the furnace had fallen in suddenly, causing the house to be filled with hot air and smoke, and doing great damage to the plants before the fire could be extinguished and the plants removed to the other propagating house.

In January, I had also an interview with Captain Fitzgerald, the Executive Engineer, under whose directions the road leading to the permanent site of the Cinchona Nursery was being made. He informed me that the difficulties he had met with in the opening out of this road were so great, that the buildings and clearing of the forest could not be commenced until the road was finished, and were not likely to be completed until April, 1864, at the soonest. On learning this, I immediately endeavoured to obtain temporary

* Supplement to the 'Calcutta Gazette,' August 15, 1863.

occupation of a site, with a dwelling-house for the European gardener, at an elevation of 6000 feet above the sea, and 2500 lower than the temporary buildings at Sinchal. After I left Darjeeling, I procured the occupation for one year of a garden and dwelling-house at Lebong, a warm, well-sheltered spur below Darjeeling, at an elevation of 6000 feet above the sea. The plants and all the stores were removed from the temporary buildings at Sinchal to this site in the first week of April. Although the distance was seven miles, the arrangements were so carefully made by Mr. Jaffrey, who personally superintended the removal of the plants, that only one plant of *Cinchona succirubra* was slightly damaged. The number of plants brought from Sinchal to Lebong on the 1st April were as follows:—

Return of Cinchona Plants in the Nurseries at Darjeeling on the 31*st March*, 1863.

Names of Species.	Remaining on 31st October.	Remaining on 31st March.	Remarks.
C. succirubra	213	328	
C. Calisaya	25	30	
C. nitida	61	100	
C. micrantha	51	80	
C. Peruviana	8	18	
C. Condaminea	None	31	The produce of eleven plants of this species brought from Ceylon on 28th January.
C. Pahudiana	1,921	1,892	
C. species ignota	7	10	
Total	2,286	2,489	

When the highly unfavourable circumstances under which the plants were placed are remembered, along with the fact that the propagation of *C. Pahudiana* had been entirely discontinued, the progress shown in this Report is satisfactory enough; for the best species, those which it is my object to increase as rapidly as consistent with the healthy condition of the plant, had been increased from 365 on the 31st October, to 592 on the 31st March. On the 1st April, 327 plants belonging to the following species of Cinchona were added to the stock at Darjeeling. These plants were obtained from Madras on the 31st January, 1863, and of the original number, 350, received from Madras, only 23 had been lost between Calcutta and Darjeeling during the two months that had intervened from the date of their arrival in Calcutta and their reaching Darjeeling. The numbers received are as follows:—

Return of Cinchona Plants received at Darjeeling, including those from Madras, on the 1*st April*, 1863.

Names of Species.	Number of Plants received from Madras on 1st April.	Old stock existing at Darjeeling on 1st April, 1863.	Total Number of Plants at Darjeeling on 1st April, 1863.
C. succirubra	97	323	420
C. Calisaya	21	30	51
C. nitida	44	100	144
C. micrantha	48	80	128
C. Peruviana	23	18	41
C. Condaminea	94	31	125
C. Pahudiana	None	1,892	1,892
C. species ignota	None	10	10
Total	327	2,484	2,811

Before concluding this general Report on the experiment of cultivating Cinchona in Bengal during the past official year, it seems to me that, in order to form an opinion of the comparatively great success that has attended the operations, a short recapitulation of the difficulties experienced at Darjeeling is necessary.

1st.—I laboured under the disadvantage, last year, of being quite ignorant of the nature of the country of British Sikhim beyond what I could learn from the accounts of Dr. Hooker, as well as from the collections of dried plants from Sikhim which exist in the Calcutta Herbarium. I had formed very inadequate ideas of the difficulty of reaching Darjeeling, of the condition of the roads leading to it, and of the resources of the Station as regards labour, especially such skilled labour as I required, such as native gardeners, carpenters, and masons. I also supposed that no difficulty would be experienced in obtaining abundance of land, the property of Government, in the neighbourhood of Darjeeling; that glass for the conservatory, and flowerpots, etc., could be procured in Darjeeling. Some idea, however, will be obtained of the difficulties with which the experiment had to contend when I state that no suitable Government-land could be got nearer than twelve miles from the station, and that, to reach this spot, an almost impenetrable forest had to be passed through, requiring every step to be cleared by Lepchas with their long knives. On leaving Calcutta, I had hoped that the permanent propagating house, the gardener's house, and huts for the coolies, would have been finished in three months. Instead of which, it soon appeared that until a bridle-path, eight miles long, could be finished, the buildings could not even be commenced, and that, instead of three months being required to complete them, two years was the shortest time in which they could be ready. No temporary buildings could be obtained either, except barracks on the windy and cold crest of Sinchal, 8600 feet above the sea. Before these could be converted into a conservatory, glass had to be procured from Calcutta, 400 miles distant. The manufacture of flowerpots was also unknown at Darjeeling, so that even they had to be obtained from Calcutta. Then no labour of any kind could be got to supply the place of the two Bengalee gardeners, who insisted on returning to Calcutta within three months of their arrival in Darjeeling, and the European gardener had therefore to perform all the operations of the simplest kind with his own hand, and this is still the case. Such an apparently easily procurable substance as white river-sand could not be got in Sikhim: not that none existed there, but during the rains the beds of the rivers were so full of water that the beds of sand were all concealed. Accordingly, a maund of sand was sent for from the Botanic Gardens in Calcutta. No packages of any kind ever reached Darjeeling from Calcutta in less than six weeks, the usual time occupied in the transit being two months. It will thus be seen that the commencement of Cinchona cultivation in Darjeeling entailed a great many preliminary operations before the propagation of plants could be attempted; and it is only now that, with tools, flowerpots, bell-glasses, and hand-frames received from Calcutta, and a determination to be contented with such means as are procurable in Darjeeling, that the success I have been able to report has been obtained.

I am glad to be able to report that on my visiting the Cinchona nursery at Lebong in the end of May I found all the plants in the highest health, and that the propagation of all the species, except *Cinchona Pahudiana*, was advancing rapidly. On my return to Calcutta, I prepared a report for submission to the Lieutenant-Governor, and which I intended to forward separately from the Annual Report. I, however, now enclose it in the form of an Appendix to the Annual Report.

Expenditure.—Provision was made for the experiment of introducing Cinchonas into British Sikhim to the amount of Rupees 14,753 : 3 : 2 from the commencement of the experiment in March, 1862, until the end of April, 1863. Considerable errors occurred in the approximate calculations of the sums required for the various charges of the year: some exceeded, while others fell below the calculated sums. The general result shows that the cultivation was carried on at a cost of Rupees 11,639 : 2 : 6, as appears by the annexed statement of the expenditure.

The unexpected charge for procuring Cinchona plants from Madras is included under the head of *Contingencies*. As a European gardener and one Mallee were sent from Calcutta to Ootacamund for the plants, the sum incurred was considerable, amounting to Rupees 13,281 : 5 : 3.

Statement of Expenditure incurred in the period between March 20, 1862, *and April* 30, 1863, *on account of the introduction and cultivation of Cinchonas in British Sikhim.*

	Rs.	as.	p.
European gardener, from March, 1862, to 30th April, 1863......	1,998	6	2
Native gardeners	266	7	0
Coolies and sirdars	677	11	10
House rent	910	0	0
Travelling allowance for Europeans	1,126	1	0
" " " Mallees	12	9	3
Transit of Wardian cases, etc..	1,302	7	9
Huts for coolies, etc.	25	0	0
Purchase and transport of flowerpots, tools, etc.	2,330	3	11
Contingencies	2,990	3	7
Total, Rupees......	11,639	2	6

APPENDIX.

From T. Anderson, Esq., M.D., Superintendent of the Botanic Gardens, Calcutta, and in charge of Cinchona cultivation, to the Secretary to the Government of Bengal.—(No. 48, dated the 25th July, 1863).

1. I have the honour to report, for the information of the Lieutenant-Governor of Bengal, that the condition of the Cinchona plants at Darjeeling on the 15th June was most satisfactory.

2. In accordance with the orders of the Right Honourable the Secretary of State for India, no attention has been given since the 1st April to the increase of the stock of *Cinchona Pahudiana.* The increase of the other species has been great, and the plants are in excellent condition, so much so indeed, that a plant of *Cinchona succirubra* had grown nine inches in thirty days. The number of all species on the 15th June was 4620 (the corresponding number on the 1st June, 1862, was 211), and these plants were so covered with vigorous shoots that I calculated that 6000 plants could be added to the number of all the species, exclusive of *C. Pahudiana*, by 15th August, making a total number of 10,000 plants on that date. The most marked increase has been in the number of plants of *Cinchona officinalis*, of which I proposed only ninety-three plants received from Ceylon and Ootacamund on the 1st May; these have been increased to 573 on the 15th June. Seven hundred of the large plants of *Cinchona Pahudiana* have been planted in the open air at an elevation of 6000 feet, and though they have been fully exposed to all weathers, from bright sunshine to heavy rain, they are growing much more luxuriantly than when they were under shelter. I have for some time been unable to distinguish botanically between the species supplied from the Ootacamund nursery under the names *C. micrantha*, *C. nitida*, *C. Peruviana*. These seem to me, in their present state, to be one and the same species, probably *C. micrantha.* I have therefore adopted that name provisionally, in hopes that some of the plants, with increase of age, will take on the specific characters of *C. nitida* and *C. Peruviana.* Mr. Thwaites, the Director of the Botanic Gardens, Ceylon, and who has given much attention to the experimental cultivation of Cinchonæ in Ceylon, finds also that from seeds supplied to him as *C. micrantha*, *C. nitida*, and *C. Peruviana*, only one species was procured, or, at least, as yet he had been unable to distinguish more than one species.

3. In the commencement of June, 1863, I supplied Dr. Simpson, Civil Surgeon of Darjeeling, with about two pounds of fresh leaves of each of the following species:—*C. succirubra*, *C. officinalis*, and *C. micrantha.* Decoctions, prepared with water slightly acidulated with sulphuric acid, were very bitter, and three patients suffering from well-marked intermittent fever were cured by the administration of these preparations alone. Towards the end of June, Dr. Simpson and I endeavoured to examine chemically the nature of the leaves of *Cinchona succirubra.* We experimented on one pound of fresh leaves. Our mode of procedure was as follows:—The fresh leaves were boiled in water in which a certain quantity of carbonate of soda had been dissolved, and the dark-coloured liquor resulting was thrown away. The mass of leaves, after having all the alkaline water pressed out of them, was boiled in water with a small quantity of sulphuric acid. This was repeated three times, and the leaves were carefully squeezed at the end of each

boiling. These acid liquors were then mixed and concentrated by boiling. The bitter acid concentrated liquor was then treated with carbonate of soda. The precipitate was collected, then mixed with distilled water, and sulphuric acid added carefully. A perfectly neutral condition was obtained by adding carbonate of soda. The fluid was filtered hot, and the neutral bitter liquid was afterwards set aside to cool, in the hopes that crystals might be obtained. Crystallization did take place on glasses under the microscope. The crystals are long and needle-shaped, and were so abundant as to appear to the naked eye as a whitish spot on the glass. A thin film of crystals (sulphate of quinine?) also formed in the surface of the fluid, and could easily be skimmed off. These, dissolved in water slightly acidulated with sulphuric acid, tasted very bitter. At this stage, however, the process was arrested, notwithstanding the removal of colouring matter by animal charcoal. The detection of crystals at all, with the means at our disposal, was unexpected. As it is, the undoubted presence of little needle-shaped crystals in a fluid obtained from the leaves of Cinchona is worthy of record.

4. The cultivation of Cinchona in British Sikhim is certain to be commenced soon by private individuals. Five hundred plants have been procured by private individuals from Mr. McIvor at Ootacamund, but they nearly all died on the route, one plant having reached Darjeeling alive. However, I have applications for more than fifteen lacs of plants, and I shall soon be able to supply a few.

Return of Cinchona Plants in the Government Nursery at Darjeeling on the 15*th June* 1863.

Names of Species.	Number on the 1st April, 1863.	Number of Plants on 15th June, 1863.
C. succirubra	420	1,024
C. Calisaya	51	53
C. officinalis	125	573
C. micrantha	323	695
C. Pahudiana	1,892	2,275
Total	2,811	4,620

From T. Anderson, Esq., M.D., Superintendent of the Botanic Gardens, Calcutta, to the Secretary to the Government of Bengal.—(No. 49, dated the 7th August, 1863.)

With reference to my letter No. 13, dated 9th September, 1862, announcing the discovery of febrifuge properties in the leaves of *Cinchona succirubra* cultivated at Darjeeling, and to my Report, dated 25th July, 1863, and which I lately submitted as an Appendix to first Annual Report on the cultivation of the Cinchona at Darjeeling, I have the honour to inform you that I have to-day received intelligence from England of the discovery of quinine in small quantities in the leaves of Cinchona sent from this country. Quinine obtained from the leaves was exhibited by Mr. Howard at the meeting of the Linnean Society, London, on the 18th June. This discovery confirms my opinion that the crystals which Dr. Simpson and I obtained at Darjeeling on the 20th and 21st June, as detailed in my last Report already referred to, were those of sulphate of quinine. As this is a discovery of importance, increasing the value of the Cinchonas from the existence of quinine in the leaves, I have to suggest that this letter and the letter to your address, No. 13 of 9th September, 1862, and No. 36 of 8th May, 1863, may be published, along with the Annual Report, in the Supplement to the 'Calcutta Gazette.'

PRACTICAL THOUGHTS ON LIGHT.

Some time ago, while sitting at my desk, I observed that one of the show carboys in the window had focussed the sunlight on my coat-sleeve, and was burning it. It is quite possible that many fires may have taken place in this way when no satisfactory reason could be given for their occurrence. It would be well,

in arranging goods and show-glasses in druggists' shops, to bear in mind this fact, and to so place goods (especially any which would readily take fire) that focussed rays of light would never fall on them.

The circumstance caused me to reflect upon the general influence which light exerts upon pharmaceutical preparations stored in shops; and knowing the prejudical effects of light upon chemicals, it is very natural to ask if it cannot to a great extent be prevented from doing so much injury.

In order that the subject may be made as plain as possible, it may not be amiss to give a general idea of the *nature* of light, and *how* it acts. To be as brief as possible, it may be remarked that a ray of light has been found to have three distinct properties at the least; namely, the property of giving *heat* and *light*, and the power of producing *chemical action*.

Men of science have demonstrated this for us by passing a ray of light through a prism, and then examining the spectrum produced. The spectrum, as first produced by Newton, appeared to him to consist of *seven* primitive colours; but since his time others have represented that there are only *three*, and that the seven are produced by the mixing of the edges of the coloured bands in the spectrum. Thus assuming blue, red, and yellow to be the primitive or fundamental colours, the other colours of the spectrum are represented to be produced by the meeting and overlapping of the bands, blue and yellow, for instance, producing green. It has been found that the red ray contains the most heat, the yellow ray the most light, and the blue, or violet ray, exercises the greatest amount of chemical action. But while the heating effect of the ray of light extends beyond the visible part of the spectrum at its red extremity, so also the chemical effect, or *actinism* as it is called, extends beyond the visible part of the spectrum at the other or violet end. It has therefore been assumed that the heating and chemical effects are due to vibrations which, although they accompany those of light, are nevertheless distinct from them. For our present purpose, however, we may consider that the heating, luminous, and chemical effects of light are associated with the coloured rays mentioned, and that the heating and actinic rays are those that do the greatest amount of damage to goods. Yellow glass completely prevents actinic action, and white opaque glass is the best adapted for keeping anything cool. It appears to be quite a mistake to keep wines and syrups in *dark* coloured bottles, for dark colours absorb heat most readily; and opaque white glass would be cooler, on account of its reflecting the heat from its surface instead of absorbing it. It is quite evident that if the plate-glass in our shop windows was tinted with pale yellow, many things might be placed in the window without the risk of suffering so much damage as they many times do; and if all our bottles were tinted yellow, many chemicals would keep longer in good condition. It would be interesting to know the exact effects produced upon different substances by keeping them in bottles of various colours.* In some cases, such as in the preservation of salts of silver, the iodides, etc., yellow glass would appear to be the best, on account of its preventing chemical action. There might be instances where chemical action was not so intense in its effects; but where the *heating* rays of light do most harm by elevating the temperature and giving encouragement to fermentation, as in the case of syrups, or in causing too much evaporation, as with ethers, in the first instance yellow glass bottles would be the best antidote, and in the second, white opaque glass would

* Some interesting and important information on the effects produced on vegetable colours by the different coloured rays of light will be found in a paper by Sir J. Herschel, in the Philosophical Transactions for 1842. It appears that the vegetable colours are affected by the luminous rays rather than the chemical ray, and that the rays most effective in destroying a particular colour are those which are complementary to it. Thus vegetable blues are most affected by the red orange and yellow rays, purples and pinks by the yellow and green rays, and orange yellows by the blue rays.—ED. PHARM. JOURN.

be the best, because the coolest. When we wish to bleach oils in our windows, it would be well for us always to be particular what tint the glass bottle has into which we place the oil. *Colourless* glass, of course, would be the best. It is possible that light affects the brilliancy of our tinctures as much as the air. Take tincture of myrrh for example: when it becomes muddy, the remedy suggested is to make up (with more spirit) the deficiency lost in evaporation; but the addition of the spirit does not dissolve the deposit, nor yet brighten the tincture. The insoluble sediment is said to be *oxidized*: now this is questionable, for gums in the preparation of varnishes are said to be much more *easily* dissolved by being freely exposed in a powdered state to the action of the air, or, in other words, *oxidized*. May the light (in this case and many others) not be the cause of chemical action?

The use of yellow bottles on our shelves might change the appearance of shops; it would compel the use of a different kind of label, as the gold label would not contrast well with yellow bottles. Chevreul's principles would lead us to choose a label of a violet hue, or a colour complementary to yellow, so that the harmony of colours might be preserved.

The objection to the use of the yellow glass in the *window* would be that it might interfere with the health of assistants by checking that portion of the light which is so essential to life. I remember having seen somewhere an account of some factory inspector who objected to yellow colouring in houses, as he always found the people most unhealthy in them. The subject may possibly be worthy the attention of those versed in such matters.

Hexham, October, 15, 1863. JAMES S. T. W. SMITH.

DUTIES OF MASTERS AND APPRENTICES.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—At the first monthly meeting of the Pharmaceutical Society's present session, it was the usual pleasure of the attending members, not less perhaps than of the Examiners and Professors, to witness the distribution of honours to the heroes of the evening and of the last session. If that gratification, then, somewhat exceeded the ordinary, it was explained in the Professors' reports; and if my own interest in the proceedings culminated to a little extravagance, I hope it was understood and will be emulated. I certainly felt it as much duty as pleasure to add my experience to that of the Professors respecting the then pronounced champion of pharmaceutical students; and, but for fear of intruding upon the meeting's already far advanced time, should have ventured a little admonitory comment upon the mutual position and duties of masters and apprentices, in this age when "Forward" is, or should be, our motto, and "Education" our watchword. Not that I can improve upon what has before been written in this Journal on the subject, nor construe more plainly the requirements of the indentures, already set forth with such parchmentine precision that he who runs may read. But certain it is that we, as natural branches of the genus *homo*, are apt sometimes to fall into a very lethargic condition, becoming quite oblivious of the interest and intellectual progress of ourselves and fellows. Would that such oblivion could be termed simply forgetfulness, though I very much fear that both master and apprentice are sometimes guilty of something more reprehensible. Taking, then, the practical value and result of such offences, we charitably divide the blame, calling it six of one and half-a-dozen of the other; and this perhaps is recognized as gospel by the million. But there remains the moral side of the matter to be considered, and the responsibility, I apprehend, cannot be so equally divided, for it falls on the head of the older.

That indentures are frequently drawn up between two individuals upon false premises, as was faithfully pictured in, and that by an able contributor to, this Journal, about six months back, I thoroughly believe; and had that writer carried his "drear and icy landscape" a little further, it would not have been difficult to see that he who undertook the "*locus parentis*" as often came short in his duty or ability, or both, as the parent or guardian of "scanty information." And in this supplement to the portrait, were our Cheltenham correspondent to try to put in a few of his "nice little touches," it remains to be proved that the "landscape" would not be left like the first, as true with as without them.

But let us hope that what is, not always will be; that the extent as well as the bent of a youth's education will be consulted before placing him to a profession which, like all of that denomination, cannot be properly acquired within the hours and place of counter duties only; that when bound, apprentices will show a disposition to work faithfully and diligently in the shop, and zealously to avail themselves of what time they can procure for study, and which I am sure will be forthcoming in proportion as it is sought; and lastly, though not least, that masters, if only in consideration of the fair premium paid them, will really do their best,—with encouragement or pressure as may be needful,—and afford their pupils every facility for obtaining a proper scientific introduction to their profession, as well as drill them into those habits which make the man of business. I consider it only a fair arrangement that all apprentices living in London, or in towns where lectures immediately connected with his profession are delivered, should have the option of attending one session during the last year of their term, subject, of course, to their being sufficiently advanced. I think also they should be allowed occasionally, if not always, to make or see made, according to their advancement, every Pharmacopœia preparation which it is conveniently possible to have made on the premises, and that no other than the recognized Pharmacopœia should be followed, where the preparation is to represent that book in the dispensing of physicians' prescriptions and family recipes, or in the supply of medicines of ordinary repute. Thus, with a little explanation as to the *modus operandi*, cause and effect, etc., at the time, and carefully reading up his manufacture after business hours or during its slack intervals, the pupil may, almost as it were by the way, get his Pharmacopœia by heart at the end of his term. Having also been brought up to the correct mode of doing things, he will not, in his first assistantship, unconsciously injure the repute of his late master, or expose his own shortcoming, by ignoring the existence of Liq. Ammon. Citrat., and substituting Liq. Ammon. Acet., or by gravely raising the specific gravity of proof-spirit to the unhappy medium of "half-and-half." The convenience with which the wholesale druggists can now supply the retailer with most preparations as cheaply as, if not more so, than he can make them himself, no doubt interferes with a great deal of home manufacture, which is avoided by some for expense and trouble's sake (and in a degree rightly so), while others, in the routine of orders, really forget its importance on behalf of their apprentices. But this should not be; and if extra expense does sometimes present itself in the way of gas consumption, smashing of apparatus, or loss of produce, etc., the liberal-minded sufferer will recollect that his pupil's premium affords due reimbursement, though the latter must not expect to escape a lecture, and sometimes an angry one, on carefulness. Nor, in virtue of the losses he must supply, will the wholesale vendor in the long run have much reason to complain. Theory without practice will avail little in scientific manipulations, for a thing once or twice made will not be easily forgotten. This principle is recommended to masters, not merely as a duty, but a source of gratification, whereby the student at the close of his term is enabled to work more successfully than otherwise for his diploma of qualification.

Of the advantage in having some final purpose in view, some testing ordeal to pass, there is also no doubt, for it gives impetus to emulation; and to be connected with any institution which holds out the means for having one's qualifications properly directed, tested, and publicly proved, frequently induces the parents of a youth to be more liberal and anxious on their son's behalf than otherwise they would think, or therefore care to feel.

From having been connected with the Pharmaceutical Society fifteen years, and as a late student at the laboratory there, I can venture to say that but for the prospect of examination I should never have read so much, during a five years' apprenticeship, as I did; and but for after practice at the laboratory, and attendance at the lectures, I could not, with like ease and satisfaction, have passed the necessary examinations. And further, my experience impressed me, as many others have independently observed, that there is not another school where, for like expenditure of money and time, so much can be acquired that is so fitted to the practical and scientific calling of the chemist and druggist.

Then, in closing these remarks, I would just beg of apprentices or improvers, who may be hesitating about joining the Society or its school, to come and see for himself; and having made personal inquiries of the Secretary and teachers at Bloomsbury Square, I think he will be agreeably surprised to find how much can be done for him, how comprehensive and complete is the system of pharmaceutical education as there instituted. If there be any who being old enough are not sensible of the benefits there offered, I fear it bespeaks their fault and misfortune; and I am sorry to believe that such complaints, supposing it fair to judge from the few that I hear direct, emanate chiefly, if not entirely, from those who have not succeeded very creditably before the Board of Examiners, or from those who have not ventured or passed at all. The sympathy of those who respect education will always attend any means for promoting it, nor discourage the patronage of schools and institutes through which the elements of knowledge are made accessible to the rising generation, who are never, certainly, *too* sensible of the value of knowledge. The chemist especially, from the comprehensive nature of his required information, is expected to keep pace with the times; his mind, like a clock, should be kept in going order; and thus, however humble his position, or unpretending his lucrative means, he will always command a certain amount of respect for doing his duties with integrity, intelligence, and skill.

Faithfully yours,

173, *Sloane Street.* CHARLES J. RADERMACHER.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—Many letters have appeared in the Pharmaceutical Journal on the subject of the "Error and its Remedies," but there is another error which requires to be remedied, to which hitherto, I believe, no allusion has been made,—the conduct of the master to the apprentice. Now let us examine their relative positions.

A youth is articled to a chemist and druggist, let him be for the nonce a pharmaceutist, and therefore the youth is supposed to be a pharmaceutist in embryo, and it is fondly hoped by his parents that he will be so instructed as to fit him, in process of time, to become a full-blown pharmaceutist—"a member of the Pharmaceutical Society by examination."

A liberal premium is given with him, and the master, by his indentures, engages to teach him the art and mysteries of the business of a chemist and druggist. The Pharmaceutical Society requires that an apprentice should have received a liberal education, and should be able to pass an examination in Latin by the clergyman of the parish, or some competent person. He

does so, passes his examination, and his professional education is supposed to commence by his receiving that elementary instruction which will prepare him for passing the examinations of the Pharmaceutical Society; and as the Society requires that candidates should be well acquainted with botany, Materia Medica, pharmacy, chemistry, and practical dispensing, even for the Minor examination, one would expect that the master would endeavour (as he conscientiously ought to do) to train up his apprentice in the way he should go, by giving him lessons in these branches of his profession: not a bit of it; in many instances from sheer inability, in others, because he thinks the trouble unnecessary, knowing that the apprentice answers *his* interests as well without a knowledge of these "arts and sciences," as some of the "outsiders" term them. No, Sir, the apprentice learns little more in his durance than to dole out "penn'orths" of medicines, to pound and sift drugs, prepare ointments, dispense a little, and if his master has a trade in cattle medicines, to compound stifling and filthy messes. Trusting you will excuse the length of this letter,

I remain, Sir, your obedient servant,

PATERFAMILIAS.

September 25, 1863.

THE JOURNAL.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Dear Sir,—I have always been, not only delighted but also instructed, whenever I have read the article in your valuable journal by Mr. Ince. There is always such a practical common-sense style about them that no one can help liking them, and it would be difficult to conceive of a person who could be so soured or biassed as to find fault with them.

The last article in the October number is of such a nature that many must feel rebuked, and yet at the same time good-humouredly goaded on to try and do something. He ignores town and country distinctions, and shows clearly that the *whole* of the members of the Pharmaceutical Society should act harmoniously as one man towards the support of the Journal and its honour.

It is time that all jealous feelings and fault-findings should be laid aside; and although it may be all right enough for every one to have his full liberty to state his opinions, yet there is little doubt that the principal objections to our Society have come from those who know least about either it or its Journal. It is possible that other sources may have enabled *some* to make pounds by certain classes of information; but such individuals ought not to forget the fact, that the information in our Journal may have enabled many to do the same thing. No man who has taken it regularly and read it carefully, dare to say conscientiously that it has been of no use to the trade. The formulæ; the opinions of first-class pharmaceutists on the preparations used in medicine; the discussions on ointments, concentrated infusions, and tinctures; the preparation of chemicals; the history and production of our medicinal plants; the reports of some of the best and most popular scientific lectures of the day; the information and advice always given so gracefully and willingly to inquiring correspondents; the well-written leaders, so pregnant with sound principles and good advice; besides many valuable and interesting articles of a miscellaneous nature which run through the whole of the volumes, stamp it with the mark of *greatness* and *usefulness*. In fact, to it, and to it alone, does the trade (even that portion who affect to despise it) as a whole owe the present status to which as a body they have attained in the eyes of the public. Instead of young men trying to destroy the operations of a Society which for the last twenty years has done so much to advance the know-

ledge of pharmaceutists, and instead of railing against the class of knowledge given, it would be much better to spend their spare time in a course of readings from the volumes of that Society, and the result would undoubtedly be that a healthier and a happier tone would pervade their observations. Some think that the sum total of all excellence in any Journal for Chemists is a "price-list," and the last new pattern of a toothbrush or shaving-box. These things may be all well enough in their way, and there can be no objection to any chemist (especially in country districts) adding the sale of a few tidy sundries to his trade; but it is absurd to reverse his ideas of his business and to speak lightly of scientific knowledge, and deem that kind of information of *less* value than a few ideas about the novelties of the season. It is high time that we should all attempt to arrive at the greatest point of scientific attainments, so far as connected with our business of pharmaceutists. We are all too far behind when we look at the progressive spirit of the age, and it is our duty to *try to understand* the noble and exalting truth of science, and tax our ingenuity to the utmost to make those truths practically useful in our daily vocations.

Any man calling himself a chemist, above all men, ought to be the last to object to a scientific journal connected with his trade. The truth is, that but for the discoveries of men of science, especially in connection with chemical research, we would not have possessed many of the novelties which we now offer for sale. How such a suggestion "that the Journal be abolished" should have arisen, is difficult to imagine. It does not follow that because many chemists have to sell oils, paints, etc., that they consequently of necessity should be destitute of either literary or scientific tastes. Many so situated might rather say with Shakespeare, "My poverty, not my will consents." To many so circumstanced a Journal like what we possess becomes rather a boon than a thing of no value, for by its means we can revel amid a class of interesting facts and articles which we could not obtain anywhere else. It may at first sight appear to some that the perusal makes the reader neither richer, better, nor wiser; but that view is a mistaken one. It is utterly impossible for a person regularly and systematically to read a well-conducted Journal without instinctively imbibing its truths and principles; and it is just as impossible to prevent those truths and principles from exercising their specific influence on his mind and character to such an extent that his business habits and ideas will be regulated accordingly. That ideas breed and propagate is as certain as the fact that seeds germinate; all that is required is a suitable soil and congenial circumstances. It is much to be wished that the body of young men who are now connected with the trade would seriously think over the great advantages to be obtained by a careful study, not only of the Journal, but of the many valuable books which it recommends. The mental culture thus brought about would be of far more practical use to them (both in their particular calling, and in their everyday affairs of life), than all complainings and grumblings put together. It is quite a mistake to suppose that the complainer and faultfinder is the true reformer; it is rather the hardworking student who *conquers* the difficulties of scientific research instead of *snarling* at them. Let not the conductors of our *valuable* Journal be discouraged, for there are many who quietly admire their work, and profit from their labour. If these remarks should in any way help to back up the wishes of your able contributor Mr. Ince, my object in writing to you will be gained; and if you think they would be of any *service* in the pages of your Journal, you are at liberty to insert them. With best wishes for the prosperity of the Society,

I have the honour to be, dear Sir,

Yours very truly,

JAMES THOMAS SMITH.

Hexham, October 1, 1863.

ADULTERATION OF POWDERED GUM ARABIC.

Sir,—It ake the liberty of sending you a sample of adulterated Pulvis G. Acaciæ, price 2*s*. per pound. Rubbed up with *cold* water, it forms a muddy mucilage, very unlike that made with pure gum. The microscope shows the presence of *rice-starch*, *sago-meal*, and *flour*. To estimate their amount, 100 grains of the powder were stirred in a beaker with a few pints of cold water, until the gum was dissolved, and after standing undisturbed for a day, the clear solution was drawn off. The starch was again washed, then collected and dried at a gentle heat. It weighed 10 grains. The practice of adulteration can only be put down by so increasing the risk of detection as to make it a losing game; and every man can do something towards that end by *making known* the devices he may discover for palming upon him adulterated for genuine articles, and thereby putting others on their guard.

Sheffield, October 20, 1863. J. T. MILLER.

WOOD NAPHTHA.

[The following statement, by Mr. Phillips, Chemist to the Board of Inland Revenue, is contained in the Report of the Board presented to Parliament, and recently published.]

When the Legislature decided to permit the use of duty-free methylated spirits in the arts and manufactures of this country, it was most probably understood that the continuance of such permission would be contingent on the safety of the revenue derived from spirits. Notwithstanding the great and undeniable benefit which has resulted from this legislative action, efforts, no doubt incited mainly by the high rate of duty on spirits, to obtain a potable spirit from methylated alcohol continue to be made; and since my last report was written, a patent has been granted for a process which professes not only to accomplish this object, but to render wood spirit itself potable, and this too at a cost which is almost nominal.

Previous to the issuing of this patent, the statements made that methylated spirit could for commercial purposes be rendered potable were vague and intangible, and consequently most difficult to controvert; but now that a detailed process for the defecation of such spirit has been propounded, there is at last something definite which may be investigated and criticized.

Having already specially reported to the Board on the capabilities of the patented process in question, it may be sufficient here to state that I have made a series of experiments, in strict accordance with the conditions specified in the patent, and also with those laid down in an almost identical patent granted to Blumberg in 1845, and that by neither of the processes could I succeed in rendering either methylated or wood spirit potable, and, to render such spirits after having been submitted to these processes as palatable as those which were exhibited during the past year as having been obtained by the first-named process, it was found necessary to submit them to numerous successive distillations, which from their costliness could not be applied profitably on a commercial scale, and even then the products possessed, as did the spirits exhibited, the character of wood spirit, although much subdued, and were in my opinion wholly useless for potable purposes.

The subject under consideration, whilst of much importance to the revenue, is scarcely of less importance to pharmacy, and it is not surprising that it has recently afforded matter for earnest discussion among some of the leading pharmacologists of the country, who, anxious to preserve the integrity of medicinal preparations, have, not unreasonably, been alarmed by the pretensions, whether true or false, of a person who not only asserts that he can so far defecate wood spirit as to render it almost indistinguishable from vinous alcohol, but who has exhibited specimens of such spirit which might be used instead of spirits of wine for pharmaceutical purposes.

As I have been already charged with speaking too confidently upon this subject, I feel that the sequel of this report will lay me still more open to the charge, more especially when I express a strong conviction, based upon long experience, that the revenue is much less liable to be injured by the abuse of the permission to use duty-free methylated

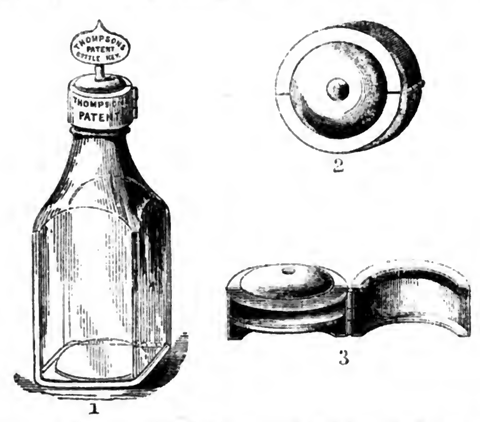
spirit than it is by ordinary illicit distillation; and I may be allowed to say further, that although fully sensible of the dangers which may arise from over-confidence, I am no less impressed with the necessity for steadily maintaining the principles upon which methylated spirit is allowed to be used, until it can be conclusively proved that such principles are fallacious and injurious to the interests of the revenue; to act otherwise would be to abandon, upon insufficient grounds, a system which on all hands is admitted to be beneficial to the community.

Before concluding this report I may be allowed to say:—First, that supposing methylated and wood spirits could be rendered potable,—which I deny has yet been done,—they would still be much inferior to the spirit produced by ordinary illicit distillation. Second, granting that methylated and wood spirits can be made equal to illicit spirit, the advantage must be greatly in favour of the latter, for whilst the purification of the first two would require costly apparatus, and involve cumbersome operations difficult to conceal, upon expensive materials, the production of common illicit spirit can be carried on with much secrecy, the apparatus required being comparatively rude and inexpensive, and the materials used of little value. Hence the purification of methylated spirit, for these reasons, can be at least as easily suppressed as ordinary illicit distillation.

Within the period to which this report relates, eighty-three samples of wood naphtha were examined, in order to test their suitability for the purpose of methylating spirits of wine.

THOMPSON'S AIR-TIGHT BOTTLE-STOPPER.*

The prevailing notion in reference to the stopping of bottles, jars, etc., is an assumption of its being necessary to insert the cork or other material *into* the neck of the vessel, whereas it is obvious that so long as the orifice is perfectly covered, and a degree of pressure, according to the nature of the contents, be exerted thereon, it will be more effectively secured than by the imperfect method of driving a cork into the mouth, with the further advantage of obviating entirely the considerable breakage which always accompanies this method, whilst the additional and troublesome operations of wiring, waxing, and capsuling, are altogether dispensed with.



It appears that from the 14th of March, 1814 (the date of the first patent), 150 patents have been taken out for various new modes of stoppering bottles. Evidence was

* This air-tight bottle-stopper was placed on the table by Mr. Reynolds, of Leeds, at the last meeting, but in consequence of press of other matter the subject was not referred to.

hereby obtained, not to deter, but to encourage the inventor to proceed with his task, and the incentive was based on the simple hypothesis that if so many unsuccessful attempts have been made to secure some simple, efficient, and inexpensive mode of stoppering bottles, there is still room for further efforts, *so long as the original and still existing method is considered imperfect, and therefore capable of improvement.*

It is also proposed to apply the stopper to a barrel, by which not only is the old bung, with its attendant hammerings and injury to the cask, superseded, but the vent-plug is also dispensed with, as the reception or exclusion of air can be effected by a single turn of the hand.

The capsule is made of tinned iron, enclosing a cork disk, and it is stated that they can be made as low as three farthings each. Fig. 1 represents the bottle with the stopper affixed. Fig. 2, the stopper closed. Fig. 3, the same open, showing the cork disk.

MISCELLANEA.

Accidental Poisoning by Laudanum.—Another case of accidental poisoning by the substitution of laudanum for tincture of rhubarb, occured at Hull, on Wednesday, October 14th. Mrs. Ann Long, it appears, sent a person named Johnson to the shop of Mr. Elliott, druggist, Osborne Street, for one ounce of tincture of rhubarb. The woman was served by Mr. Elliott, and took what she had purchased to the deceased, who drank about half of it. Shortly afterwards Mrs. Long experienced a feeling of numbness, and Mr. Elliott was sent for, who, as soon as he had examined the remaining portion of the contents of the bottle, said it was laudanum, and that he had mistaken the laudanum bottle for the one containing tincture of rhubarb. He at once administered an emetic, but as the deceased continued to get worse, Dr. Usher was called in, who pronounced her recovery impossible. She continued to sink rapidly, and died in about three hours from the time of taking the draught. An inquest was held, at which Dr. Usher stated that he had made a *post-mortem* examination, but was unable then to account for the cause of death; he therefore requested that the contents of the stomach should be analysed for that purpose. Ultimately, a verdict was returned to the effect "That the deceased had died by misadventure; and they recommended that for the future Mr. Elliott should be more careful as to placing poison bottles amongst his other ordinary shop medicines."

Poisoning by Belladonna.—On Saturday, October 3, six children, of ages varying from two to five years, living in Wolverhampton, having been attracted by the berries of the Atropa Belladonna in a garden, ate very freely of the poisonous berries. About an hour afterwards the usual symptoms made their appearance: first, there was an unusual desire for sleep, followed by hysterical agitation. Medical aid was obtained, and remedies were administered, which with the elder children proved successful; but the younger boy gradually sank into a stupor, which on the following day ended in death.

Suicide by Cyanide of Potassium.—On Saturday, October 3, Dr. Lankester held an inquest on the body of James Lamb, of Charlton Street, Somers Town. It was stated that the deceased had been afflicted for some time with a tumour on the under lip, which he thought to be cancer, and fancied that there was no cure for it. He seemed to have suffered much pain, and on the Wednesday night previous was in great agony, and on the following morning he was found by his wife unable to speak. Mr. Wesley, medical officer of the St. Pancras Dispensary, was sent for, who, on his arrival, found Lamb quite dead; a bottle and tumbler, both containing cyanide of potassium, were found by his side. A *post-mortem* examination left no doubt that the deceased had died from the effects of cyanide of potassium, which, according to the evidence of the wife, had been procured for use in photography.

It was proved that the deceased had not been afflicted with cancer, but there was no doubt that it was the fear of death from cancer that induced him to take the poison. Dr. Lankester observed that the use of this poison in cases of self-destruction had become much more frequent, which might be accounted for by the cyanide having become an article of general use in the practice of photography.

The jury returned a verdict to the effect that the deceased had committed suicide while in an unsound state of mind.

OBITUARY.

We regret to have to record the decease of Mr. Bucklee, of 86, New Bond Street, who died on Saturday morning, October 3, aged fifty-one. In the death of Mr. Bucklee, the Pharmaceutical Society loses a staunch supporter. For thirteen years he was a member of, and regular attendant at the Council Board, and an active and assiduous member of the finance and other committees until the time of his decease. His loss will be greatly felt by all those who were acquainted with his amiable and kindly disposition.

BOOKS RECEIVED.

De la Pharmacie. Par M. Fumouze. Paris: F. Chamerot, Libraire-Editeur.

On the Characters, Actions, and Therapeutic Uses of the Ordeal Bean of Calabar. A Graduation Thesis, for which a Gold Medal was awarded by the Edinburgh University, August, 1862. By Thomas R. Fraser, M.D. Edin., etc. Edinburgh: Oliver and Boyd, 1863.

TO CORRESPONDENTS.

Henry Hill (Kendal).—Fownes's 'Chemistry;' 'The Pharmacopœia;' Bentley's 'Manual of Botany;' 'Selecta è Prescriptis;' and Royle's 'Materia Medica.'

An Apprentice (Aberdare).—(1) Bentley's 'Manual of Botany,' price 12*s.* 6*d.*; and Fownes's 'Manual of Chemistry,' price 12*s.* 6*d.* (2) The new Pharmacopœia may be expected about the 1st of December next.

J. Jones (Cardiff.)—'Selecta è Prescriptis.'

An "American Pharmaceutist" would probably succeed better in preparing "Phosphorus Paste" by reducing the phosphorus to a granular condition by brisk agitation with spirit, before mixing it with the other ingredients.

V. A. (Brighton).—Bentley's 'Manual of Botany.'

E. S. (Bristol).—*Walnut Pomade for darkening the Hair.* We suppose this is made with the juice of the fruit, or leaves.

T. R.—The label, a copy of which has been received, would be liable to the Stamp Duty.

A Registered Apprentice.—Lane's 'Compendium of Materia Medica and Pharmacy, adapted to the Pharmacopœia.' Churchill.

E. C. (York).—*Solution of Malate of Iron* may be made by beating to a pulp 6 lbs. of unripe crab-apples, to which add 1 lb. of coils of iron wire; digest in a water-bath for eight days, take out the wire and express; evaporate the clear liquor in a porcelain vessel, with constant stirring, to the consistence of a soft extract. One part of this extract should be mixed with twelve parts of water to form the solution.

J. J. (Nottingham), wishes to know the method of preparing *Carbonized Paper*, used in taking copies of letters.

X. Y. Z.—The 'Pharmaceutical Latin Grammar' will be found useful, but other works on the same subject must not be neglected.

J. B. S. (Leighton Buzzard).—(1) We are unacquainted with the article referred to, and therefore cannot give the caution required. (2) *Liq. Bignoniæ.* We know of no formula for this preparation. A tincture of the bark of the root of *yellow jasmin* is used in America. In the absence of any authentic formula, we think the *liquor* might be prepared in the proportion of four ounces to the pint.

Mr. T. Lowe (Liverpool), Mr. J. F. Thursfield (Evesham), Mr. Henry Long, Mr. E. White, Mr. Emerson J. Reynolds, A Major Associate, and others, are thanked for their communications.

Erratum.—Page 188, line 21 from the bottom, *for* "bisulphate" *read* "bisulphite."

Instructions from Members and Associates respecting the transmission of the Journal before the 25th of the month, to Elias Bremridge, Secretary, 17, Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Messrs. Churchill, New Burlington Street. Other communications to the Editors, 17, Bloomsbury Square.

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. V.—No. VI.—DECEMBER 1st, 1863.

OUR EVENING MEETINGS.

The Evening Meetings of the Pharmaceutical Society were among the earliest arrangements of the Institution; the very Society itself may be said to have been founded at such meetings, when a few honest and earnest men of our order deemed the time ripe for an effort to elevate Pharmacy in Great Britain to the rank which it had long occupied in other countries.

If we turn back to the early pages of our Journal, we shall see how high an importance was attached to the periodical gatherings of Pharmaceutists for the friendly discussion of subjects which might be suggested in the ordinary occurrences of their every-day experience; how it was dreaded that "*the charm of novelty and stimulus of fashion*" ceasing to exert their influence, the members might "*gradually relax in their zeal, the supporters one by one fall off, and that which commenced with a blaze, end in smoke.*"

At the end of twenty years it behoves us to consider well the influence these meetings have had in advancing the objects for which they were designed; the interest which has been displayed in them by our members hitherto; and our duty for the future.

First, then, the effect produced; and in estimating it we must look back to the views and expectations of our founders, and the condition of things at the outset. The effect desired was undoubtedly the advancement of Pharmacy *by Pharmaceutical Chemists*, and as a necessary consequence the improvement of chemists individually, and the elevation of their status collectively. We find in an article published in the Journal of January 1, 1843:—

"The subjects which generally claim the attention of the Society on these occasions, are those which are calculated to elicit practical information, and to lead to improvements in the processes daily employed by the Pharmaceutical Chemist. We have, until lately, enjoyed no opportunity of comparing our ideas on these subjects; we have had but little scientific intercourse with each other; and while every other branch of the medical profession has been provided with an arena in which new facts could be promulgated, and new theories discussed, the Pharmaceutical Chemists have left their province in the hands of others, and neglected those means which might have enabled them to improve their position in the profession, and keep pace with the advancement which has been making around them."

The Pharmacopœia is spoken of as the text-book of the chemist, with every process of which he must be familiar, possessing more practical knowledge of the advantages and difficulties of its manipulations than anybody else; "and

yet," it is said, "*he is scarcely allowed the privilege of suggesting an alteration.*" The chemists are declared to have been overlooked and disregarded on account of their "*apathy and indifference,*" and to have only themselves to thank "*for such a moral degradation.*" We think our older members will not question the truth of these remarks, any more than that they will deny the fact that in those days the great object was to conceal rather than reveal any improvements which might have been worked out or stumbled on in the pursuit of pharmacy, the fortunate discoverers being apparently ignorant of, or indifferent to the fact that in comparing notes with our fellow-workers the advantage is generally mutual; that it not only increases the knowledge of him who stands forth, as he supposes, to teach, as well as of those who hear, but that it enlarges and liberalizes the mind, gives a higher tone to the feelings, and dissipates those asperities and jealousies which too often embitter the intercourse between men of the same calling.

While we acknowledge this to have been our former condition, we may certainly bring our present state into very favourable comparison. Pharmaceutical chemists having established union among themselves, are no longer despised or disregarded by the higher branches and members of the medical profession. Through our evening meetings we have become better known and respected; many distinguished members of the medical profession and men of science have attended, and even assisted in our discussions; and vastly many more have, through the Journal, become acquainted with our proceedings. We are not denied a voice, indeed we have been invited to take part, in the compilation of a new Pharmacopœia, and we believe our forthcoming text-book will contain ample evidence that the science of pharmacy has been advanced by pharmaceutical chemists, and that the discussions of our evening meetings have left their impress thereon. And while regarding this as the most obvious, but by no means the only evidence of the benefits achieved, we must give all credit to those who have worked for such advancement. The Journals of past years record the part which has been taken by our members in investigating the merits of new remedies, and the improvements which were desirable in old ones; from time to time, too, we find them bringing adulterations and impurities under notice, and we could name medicines in every-day use of which genuine specimens were formerly the exception, and are now the rule; it was but necessary to draw attention to the evil to ensure a remedy. The names of these men are too familiar to our readers to require mention; many of them unfortunately we miss from among us now; the hand of time has done its work; but some of the very earliest voices are still heard occasionally, and we would urge our younger members—men who have come into the Society with all the advantages of education, proved and certified by examination—to take up their strain, that there may be no break in the discourse.

This is clearly our duty for the future. There are "signs in the times" which it were madness and folly to neglect. Many of us have doubtless read the 52nd Report of the "*General Council of Medical Education and Registration.*" It is all-important to Pharmaceutical Chemists. We there find a recommendation from the Pharmacopœia Committee *that the improvements in medicine and pharmacy should not be allowed to accumulate long without being introduced by authority to the medical profession at large;* and "to this end the Committee advise that—

"1. *In each capital of the three divisions of the kingdom respectively, the Branch Committee should appoint a person to undertake this duty who is a medical practitioner, acquainted with the natural history of chemistry and pharmacy.*

"2. *That it should be an instruction to these gentlemen to invite information as to improvements in the Pharmacopœia, from the medical, surgical, and pharmaceutical bodies of the several divisions of the country.*"

Here, then, is work for qualified pharmaceutists, and ample material for discussion. All dispensers know and feel the great inconvenience—now greater than ever—of having prescriptions put into their hands for preparations which have no authorized form. There is first the humiliation of being unable to give your customer that full information regarding his medicine, which it is the growing habit of customers to require; there is next the unpleasantness of being compelled to make him wait a couple of hours for an article which might be dispensed in five minutes; and last, not least, there is the uncertainty whether the medicine which you have procured from the laboratory of A., shall be the same as one of a similar name prepared by B.

We would by no means say that all the *new remedies* and *improved forms of medicine* of the present day are improvements in pharmacy, and should be adopted by the Pharmacopœia; far from it—we earnestly trust that the proposed standing Committee will have power, and use it too, to reject as well as adopt; but we do say that all these things should be discussed among us; there would be no surer way of discovering their merits or demerits; and by such means we might perhaps avoid that reproach to pharmacy which we now witness as a growing evil, of certain compounds being naturalized in practice under false names, names of definite chemical signification to which they have no title.

Within the year we have seen a Pharmaceutical Conference established, and our Society may congratulate itself on having fostered the spirit from which it springs. The promoters of that Conference were among our earliest supporters, pupils and prizemen. They are our supporters now, and there should be no rivalry between the two associations, save that which would urge each on its way to success, and mutually benefit both.

The annual discussion at some great centre in the country, should enrich rather than impoverish the evening discussions at Bloomsbury Square, and we hope our friends who are preparing to go to Bath in the summer, will not the less favour us with their company during our winter session, and arouse in the Society generally such an interest in pharmacy as shall in turn fill the City of Bladud with the votaries of Æsculapius.

SWEET SPIRIT OF NITRE; ITS IMPURITIES AND ADULTERATIONS.

The 'Lancet' has commenced a series of articles on the "Impurities and Adulterations" of medicines, and *sweet spirit of nitre* forms the subject of the first of these articles. Thirty-one samples of this popular medicine were submitted to examination, having been obtained principally from the low districts at the East-end of London, about the Docks, Whitechapel, Shadwell, etc.: there were however five samples obtained from West-end chemists. The examination appears to have consisted in the determination of the specific gravity, the amount of free acid, the presence or otherwise of aldehyde, and the indications afforded by the smell and taste of the presence of methylated spirit and empyreumatic oils. No less than fourteen of the samples, we are sorry to say, but all from the low neighbourhoods, afforded evidence of methylated spirit having been used in the preparation, and five other specimens are described as having an empyreumatic taste.

The analyst in his report states that "Spiritus Ætheris Nitrici of the Pharmacopœia, commonly known as *sweet spirit of nitre*, consists of a mixture, in definite proportions, of hyponitrous ether and alcohol." He gives the specific gravity of the spirit made by the London process, namely, ·834, and taking this as his standard, compares the samples under examination with it. He says,

"The addition of water of course increases materially, and in proportion to the extent of the addition, the weight of the article; *so that for the purpose of ascertaining whether water is present, and if so, the amount, nothing more is requisite than to ascertain, at the temperature of about 60° Fahr., the specific gravity of the liquid, and to compare this with a table showing the weight of spirit of nitric ether containing different percentages of water.*" He then gives a table representing the specific gravities of mixtures of spirit of nitre with different proportions of water, by reference to which he proposes to determine the percentages of water in the samples under examination. This is certainly a very simple and easy mode of jumping to a conclusion, but the result is likely to be very far from the truth.

If the analyst had started by stating—which would have been more like the truth than the statement he makes—that sweet spirit of nitre consists of a mixture, in *indefinite* proportions, of nitrous ether and spirit of wine, and if he had further stated that the nitrous (or hyponitrous) ether has a specific gravity, according to Liebig, of ·947, he might have shown that the addition of this ether "increases materially, and in proportion to the extent of the addition, the weight of the article;" and he might then have given a table of the specific gravities of mixtures in different proportions of nitrous ether and spirit of wine, for the purpose of showing the proportion of nitrous ether in a sample under examination. This method of determination would have been quite as likely to give correct results as the other; but, in fact, neither of them could be relied on without other analytical operations, of which no account is given in the report. The statements made in the report with reference to the proportions of water in the specimens examined, are therefore, as far as we know of the method of determination adopted, unworthy of confidence. The exact determination of all the constituents of sweet spirit of nitre is not, we admit, an easy task, and the analyst might be excused for failing to accomplish his object in this respect very completely. But, on the other hand, the production and preservation of sweet spirit of nitre that shall consist of "a mixture in definite proportions of nitrous ether and alcohol" and nothing else, is also beset with considerable difficulty, and pharmaceutists may be excused for failing to accomplish this object, as even the most eminent chemists have failed to show how it can be accomplished.

We are given to understand that there will be a new and improved process for making sweet spirit of nitre in the forthcoming Pharmacopœia, and we hope it will afford the means of overcoming the difficulties which have hitherto attended the preparation and preservation of Spiritus Ætheris Nitrici.

It is stated that the subject of the next report in the 'Lancet' will be "Spiritus Ammoniæ Aromaticus."

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *November 4th*, 1863,

Present—Messrs. Bird, Deane, Hanbury, Haselden, Hills, Mackay, Meggeson, Morson, Sandford, Savage, Squire, and Waugh,—

Mr. THOMAS HERRING, 40, Aldersgate Street, was unanimously elected to fill the vacancy in the Council, caused by the lamented decease of Mr. W. H. Bucklee.

The following were elected

MEMBERS.

Edward John Owles................................BUNGAY.
Jacques Léon Olivier ....MAURITIUS.
James Aston Briggs................................WOLVERHAMPTON.

EDINBURGH, *November 10th*, 1863.

MAJOR EXAMINATION.

John Young ....Galashiels.
James Walls White ....Kirkwall.

PHARMACEUTICAL MEETING.

Wednesday, November 4th, 1863.

MR. G. W. SANDFORD, PRESIDENT, IN THE CHAIR.

The following

DONATIONS TO THE LIBRARY AND MUSEUM

were announced, and the thanks of the meeting given to the respective donors thereof:—

The Proceedings of the Linnean Society.
Bulletin de la Société Chimique de Paris. From the respective Societies.
The Chemical News.
The Chemist and Druggist.
The Dental Review.
The British Journal of Dental Science.
The Journal of the Chemical Society of London.
The Photographic Journal.
The Educational Times.
The Technologist.
The Journal of the Society of Arts.
The Veterinarian. From the respective Editors.
Iodoformognosie, ou Monographie Chimique, Physiologique, et Pharmaceutique, de l'Iodoforme. Par Giovanni Righini. From the Author.
A Specimen of Sulphur Ore. From a mine at Cesena, in the Apennines. Presented by Mr. R. J. Bearcroft.
A Specimen of Glycerine spontaneously separated from olive oil. Presented by Mr. R. B. Groves, Weymouth.

ON THE MANUFACTURE OF BALSAM OF PERU.

BY DANIEL HANBURY, F.L.S.

It is now thirteen years since the late Dr. Pereira laid before the Pharmaceutical Society of Great Britain some account of the process by which the liquid known as *Balsam of Peru*, is prepared in the State of Salvador in Central America, and at the same time described, so far as the imperfect materials at his disposal would allow, the tree from which the Balsam is obtained. Subsequently to this, namely in the year 1860, Dr. Charles Dorat of Sonsonate in the State of Salvador communicated to the *American Journal of Pharmacy* a notice of the manufacture of Balsam of Peru completely confirmatory of that given by Dr. Pereira, which account was republished in the *Pharmaceutical Journal.*

The Balsam-tree, which Pereira at first regarded as *Myroxylon pubescens* HBK, was afterwards called by him provisionally (until materials for a complete

botanical description should be obtained) the *Myrospermum of Sonsonate.* Upon the death of Pereira, the late Dr. Royle drew up in botanical terms a description of the tree, upon which he conferred the name of *Myrospermum Pereiræ*, which in 1857 was changed by Klotzsch of Berlin to *Myroxylon Pereiræ*, he maintaining the distinctness of the two genera *Myrospermum* and *Myroxylon.**

The question of the origin of Balsam of Peru having been thus elucidated, there may seem little reason for again bringing it before the Society; but having received within the last fortnight, through the kindness of Dr. C. Dorat, somewhat ampler information upon certain points, accompanied by some excellent original sketches representing the collection of the balsam at Juisnagua, near Sonsonate, I think the subject sufficiently interesting and important to deserve further attention. I am the more strongly of this opinion because I find that continental pharmacologists are by no means agreed as to the botanical origin and place of production of the balsam, or even as to the mode of its manufacture, one of the most recent writers describing it to be obtained by boiling the bark and branches or else by destructive distillation like tar, and two others naming four species of *Myroxylon* as being probably employed to yield it.

Dr. Dorat, with whom I have interchanged letters occasionally for some years and from whom I recently requested information upon certain points connected with the history of Balsam of Peru, thus replies to the inquiries contained in my last letter.

As I presume that you are writing a description of the Balsam-tree, I send you by return steamer the required answers to your questions, together with a specimen of the naturally-exuded resin, and a few beetles which are invariably found under any part of the decayed bark of the *Myrospermum.*† That no possible mistake might exist on my part, I rode to Juisnagua, it being still the collecting season, and took a sketch of the process, which, with a verbal description, will, I trust make all clear to you.‡

Now to answer your questions:—as to the *natural* or *spontaneous exudation.* In young trees, say, until the sixth or eighth year I have never seen any. After that age a greenish resin is frequently found during the summer months on the northern side of the trees when they are at rest, that is from December to May. It is at first frothy and of a pale yellow colour, but as it becomes hard it changes to green. It occurs in small quantities and is difficult to get clean, as it is very sticky. It has a slightly bitter taste, but no aroma. The Indians consider that the trees which produce much of it yield an inferior balsam. This however is only one of their many superstitions concerning these trees. The largest quantity I have myself seen was upon a very old tree; it appeared in large tears lying one over the other, almost like grapes.

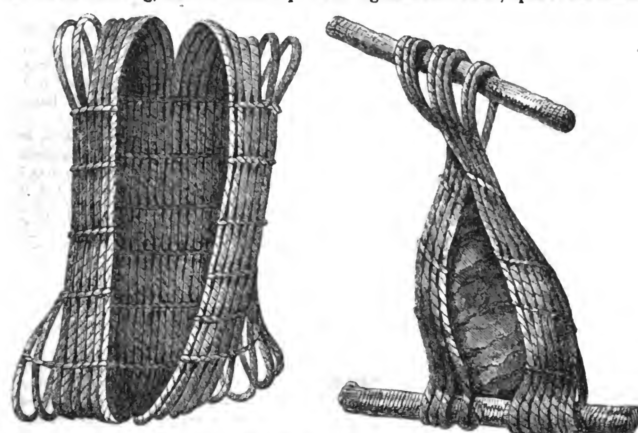
Early in the months of November or December, or after the last rains, the balsam-trees are beaten on four sides of their stems with the back of an axe, a hammer, or other blunt instrument until the bark is loosened, four intermediate strips being left untouched that the tree may not be injured for the next year. Five or six days after, men with resinous torches, or bundles of lighted wood apply heat to the beaten bark, which becomes charred. It is left eight days during which the burnt pieces of bark either fall or are taken off. As soon as they perceive that the bare places are moist with the exuding balsam, which takes place in a few days, pieces of rag (of any kind or colour) are placed so as entirely to cover the bare wood. As these become saturated with the balsam, which is of a light yellowish colour, they are collected and thrown into an earthenware boiler, three-quarters filled with water, and stirred and boiled gently until the rags appear nearly clean, and the now dark and heavy balsam sinks to the bottom. Fresh rags belonging to the same owner are continually being put into the boiler until sun-down, when the fire is extinguished; when cold the water in the boiler is poured off, and the impure balsam set aside. During this process the rags that appear to have been cleared of balsam are

* *Bonplandia*, 15 Sept. 1857, p. 274.

† Mr. Francis Walker, who has been good enough to examine this insect, considers it identical with the *Passalus interstitialis* of Percheron.

‡ [The woodcut representing this sketch is unavoidably deferred to our next number.—Ed. Ph. Journ.]

taken out of the boiler at different times and given to a man to be pressed, by which means much balsam is still obtained. The press consists of a small open bag about fourteen inches long, made of stout rope fixed together with twine, open at the middle

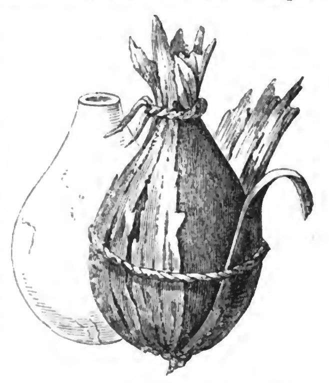


Rope Bag used for pressing the Rags.

and looped at both ends to receive two sticks. The rags are placed inside, and the whole is twisted round by means of the sticks and the balsam thus squeezed out. A washer-woman wringing out a wet cloth, fairly represents the process. The balsam thus procured is added to that in the boiler. The next day, the cold balsam is weighed and put into *tecomates* or gourds of different sizes and sent to market:—its price at present is 5 reals per pound. If it is wished to purify it, the boiler is left standing for several days, when the impurities float to the surface and are skimmed off. A little water is also left to float at the mouth of the tecomate when brought for sale. These *tecomates* are tied up in plantain leaves, with a stopper of the same.

A very fine quality of balsam is collected from the broken pods in the same manner as above.* It requires more trouble and care to collect, and there being no demand for it, it is scarcely ever met with. I believe it is known as *Balsamo blanco*. From the flowers there is distilled a most delicious and fragrant *aguardiente*, far superior to any brandy.

A healthy tree will produce balsam well for about thirty years, after which, if allowed to remain untouched for five or six years, it will again produce. The collecting begins



Gourds, or *Tecomates*—one covered with plantain leaves.

* It is more probably made by simple expression, and not by boiling.—D. H.

shortly after the last rains, that is, some time in November, and is supposed to be finished in May. During the rains none is collected. In the dog-days, that is from the 15 July to the 15 August, there being scarcely any rain here, a small quantity is collected by a few enterprising Indians.

The beating, and application of rags is only made during four days of each week, that is four *cosechas* (harvests) per month. Should the flow of resin decrease, fresh heating and rags are applied, and after eight days the boiling is resumed, and so on as long as the dry season permits. It was formerly the practice to apply fire to cuts made in the bark and to allow the exuding resin to burn for a short time: now after a good beating the bark is only heated by torches or burning wood.

I believe I mentioned to you that before the conquest and for a short time after, balsam formed a part of the tribute paid to the chiefs of Cuscatlan, the chief department of the State (now S. Salvador), and was brought from the coast in earthenware jars representing the *pajuil* or Mexican pheasant (*Crax globicera*). Many of these old jars are now found in the mounds and excavations of the ancient *pueblos* on the coast. I send you a copy of a broken one in the possession of our worthy Bishop. It is one-fourth the original size. The *pajuil* feeds on the young nuts, and is found in great numbers on these trees during the season.



Ancient Tributary Balsam Jar.

The small *pueblos* scattered over the so-called *Balsam Coast* are numerous. The principal ones are:—

Juisnagua, a moderate sized pueblo, about six leagues from Sonsonate, formerly rich in cacao, but at present of small account. It is the first town where balsam is produced; there are in the vicinity about 400 balsam-trees.

Tepecoyo, or Coyo, (Indian *Mount of Wolves*), on an elevated ridge, the valleys on either side being well watered, is situated twelve leagues S.E. of Sonsonate. About a league south of the town there is a gold mine, which was opened in 1832, and the ore sold in Guatemala. Owing to the depravity of the Spanish miners, the Indians rose against the owner and expelled him, since which they will not allow any one even to visit it. The produce of this pueblo in balsam is small, having been last year only sixty arobas of twenty-five pounds.

Támanique, situated in a circular valley, surrounded by very high and heavily timbered mountains, among which are numerous tigers, wild hogs, lions (puma), and four-fingered green monkeys. Vanilla is plentiful, but not of the finest quality. There are at present

worked 1400 balsam-trees, producing about 160 arobas yearly. In the vicinity are 1500 cacao-trees of fine quality producing seventy arobas of cacao-beans. The Indians are a drunken and superstitious race.

Chiltiuapan, near the sea, on an elevated and extensive plateau, between two rivers, the Sonto and the Sonsapuapa, running to the sea, with fine fish, and numerous caymans. The dense forests surrounding this pretty pueblo, contain 2569 balsam-trees, producing 450 arobas of balsam, value about $3500. The next article of value is cacao, of which there are 1700 trees, value of produce this year $830. The Indians of this pueblo are honest and very industrious, as besides the balsam and cacao they have now coffee plantations, and grow much Indian corn. The dress of the women consists only of a small petticoat, crimson, with a black stripe. They speak the Nahuat idiom.

Talnique, at the foot of the Cerro del Tamagas, or Snake-hill, situated on a most extensive and fertile plain, six leagues from Sonsonate, S.E. There are not above 500 balsam-trees about this pueblo. It is more noted for its fine qualities of timber, vanilla and cacao. It is from this vicinity that the best *mora* (fustic) is obtained, and also the finest grained rosewood (Grenadilla). The streams, of which there are several, abound in leeches, which are often sold in Sonsonate at four reals each. The Indians being in constant communication with Sonsonate are a vicious and lazy race. As in most of these pueblos, the wild animals commit great ravages among the cattle.

Jicalapa, situated on a small plain, about three leagues from the beach, intersected by deep gulleys (*barrancas*), heavily wooded, principally with large cedars. The Indians are an idle race, and only cultivate about 1200 balsam-trees although many more exist in the dense woods, which remain uncleared. The heat is very great, and the climate most unhealthy. Maize is mostly cultivated, and plantains are numerous. The animals are tigers, pumas, warris, ant-eaters (two varieties), armadilloes and large black monkeys which form a great portion of Indian delicacies.

Teotepeque, a small pueblo, situated on a beautiful eminence sixteen leagues from Sonsonate and one league from the sea. The climate is very hot, often 105° F. in the shade, but from its elevation very healthy. The men wear a scanty breech cloth, and the women only an apology for a petticoat. They are the most debased of all the Indians of the coast, plant a little corn and live principally on fish and every kind of animal, including their favourite dish the Iguana. There are plenty of balsam trees on the slopes of the mountains, but not above 300 are worked. They sell their balsam to the neighbouring pueblos in exchange for *manta*. The hills also produce sarsaparilla, and several gums, incense, etc.

Comasagua.—This town, although producing a little balsam does not belong really to the balsam coast, being nearer San Vicente. There are about 1000 trees, but their cultivation has been nearly abandoned for that of coffee, the climate being cool and appropriate to that plant. The balsam is sold in San Salvador. They have vanilla, maize, wheat, rice, potatoes, peaches, and a variety of fruit to supply the market of San Salva-, dor. The inhabitants are mostly Ladinos, very steady, brave, and industrious. The dress of the women changes here to red and blue checkered.

Jayaque.—This town, which from records has existed for 260 years, is situated on the fertile declivity of a mountain called La Cumbre, a few leagues from Izalco, and near the hot river Cachal. There are about 1000 balsam trees under cultivation. Sugar however is the principal branch of industry, value this year in *panela* or moist sugar $4000. The forests abound in fine woods, mahogany, cedar, rosewood, fustic and laurel, copalchi and a few quina trees, with sarsaparilla. About the year 1780, this town, then very large, was nearly destroyed by a flood of liquid mud, that issued suddenly from a small hill opposite; a great portion of the inhabitants fled to the upper lands, and settled the present pueblo of Ateos, on the main road to San Salvador. The whole of these lands are volcanic, and form part of the volcanic group of Santa Ana and Izalco.

These are the principal towns trading in balsam, there are however many small villages and *chacras* or farms, having trees and working them, with whose names I have not become acquainted. The Indian name of the balsam is *Hōō shi-it*, or *Oō shēēt;* in Spanish it is called *Balsamo negro.*

The drawings I enclose you, are first, a sketch of the process of extracting the balsam; second, a *Tecomate* with its covering, and the open bag used as a press; third, sketch of a tribute jar representing the *pajuil.*

In addition to the sketches here referred to, and which are reproduced in the

woodcuts of this paper, Dr. Dorat has favoured me with specimens of the Balsam-tree, *Myroxylon Pereiræ* Kl.; and as I have also received it from three other independent collectors, I do not feel the least hesitation in regarding it as the source of the whole of the Balsam of Peru of commerce. Dr. Dorat is himself of this opinion; and the late Mr. Sutton Hayes who was an excellent botanical observer, and who gathered specimens of the tree at Cuisnagua and in other places, assured me that so far as he knew, no other species of *Myroxylon* occurs on the Balsam Coast or in Guatemala.

Although there is some evidence to show that the balsamic exudations of one or two other species of *Myroxylon* or *Myrospermum* were formerly collected in other parts of tropical America and sent to Europe as *Balsam of Peru*, it is hardly on that account the less certain that for nearly three centuries the great bulk of the drug imported has had the same origin as that of the present day. At the period of the Spanish conquest, the balsam was an important production of the very region where it is still obtained, as is evidenced by it forming part of the tribute carried by the aborigines of the coast to the chiefs in the interior. It appears moreover, that the estimation in which it was held by the Indians was soon shared by their invaders; for in consequence of the representations of missionary ecclesiastics, Pope Pius V. was induced to issue a bull under date 1571, authorizing the use of the balsam produced in the country for the preparation of the Holy Chrism of the Roman Catholic Church. A copy of this curious document is preserved among the archives of Guatemala (of which state Salvador was formerly a part), as well as in the Vatican at Rome.* As to the balsam having acquired the name of Peru, a country so remote from its place of production, the circumstance is intelligible when we know that during the early period of the Spanish dominion, the productions of Central America were shipped to Callao, the port of Lima, the capital of Peru, and great emporium of its trade, and thence transmitted to Spain. From this cause the drug acquired the name of the country from which it was shipped to Europe, exactly in the same manner as *Turkey* Gum Arabic, *Turkey* Myrrh, *East India* Rhubarb, *Bombay* Senna, etc. have acquired and still bear designations very little indicative of their real origin. In proof of this I may quote an interesting passage occurring in De la Martinière's *Dictionnaire Géographique* (Paris, 1768), where under the head *Callao*, the author enumerating its imports, mentions as coming from Sonsonate, Realejo and Guatemala, the *Balsam which bears the name of Peru*, but which, says he, *comes in reality almost entirely from Guatemala*. He adds that there are two kinds of it, the *white* and the *brown*, the latter being the more esteemed.†

Alcedo, author of a Geographical Dictionary published at Madrid in 1786–9, writing of Sonsonate, observes that it includes in its jurisdiction the celebrated *Balsam Coast*, where is produced the richest balsam, which in all parts is held in particular estimation.‡ He further mentions that the only commercial port

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* *Vide* also *Pharm. Journ. and Trans.* vol. ii. (1861) p. 446.

† " . . . Dans la même rue du côté du nord, sont les magasins des marchandises que les vaisseaux Espagnols apportent du Chili, du Pérou et du Mexique.

Du Chili viennent les cordages, les cuirs, les suifs . . .

Du Mexique, comme de *Sonsonate, Realejo, Guatemala*, de la bray et du gaudron qui n'est bon que pour le bois, parce qu'il brûle les cordages; des bois pour les teintures, du souffre et du baume qui porte le nom de Pérou, mais qui vient effectivement presque tout de Guatemala. Il y en a de deux sortes, de blanc et de brun; ce dernier est plus estimé, on le met dans des cocos quand il a la consistance de la bray, mais communément il vient dans des pots de terre en liqueur, alors il est sujet à être falsifié, et mêlé d'huile pour en augmenter la quantité."—De la Martinière, *Dictionnaire Géographique*, (Paris, 1768, fol.) Tome 2, p. 48.

‡ "Comprehende en su jurisdiccion la celebrada Costa del Bálsamo, de donde se saca el mas rico que se conoce, y tiene particular estimacion en todas partes."—*Diccionario Geográfico-Historico de las Indias Occidentales ó América*, tomo iv. (1788) p. 577.

is Acajutla, four leagues from the capital, and that it is frequented by vessels from New Spain, Terra Firma and Peru.

Juarros in his *History of Guatemala*, describing the province of S. Salvador, remarks that its natural productions are in general, similar to those of the other provinces on the southern coast, but that the balsam-tree is found exclusively in that province, upon what is called the *Balsam Coast*, which extends from the port of Acajutla to the Bay of Jiquilisco.*

Baily, a recent author, whose work entitled *Central America* appeared in 1850, remarks that the Balsam was long erroneously supposed to be a production of South America, for in the early period of Spanish dominion it was usually shipped to Callao, in Peru, whence it was sent to Europe, where it received the name of *Balsam of Peru*, being deemed indigenous to that country.

The old method of preparing the balsam does not appear to have been that resorted to at the present day, for Dr. Dorat has stated that the Spaniards were in the habit of obtaining it by cutting down the trees and boiling the wood,—a wasteful and destructive practice which was afterwards prohibited. Whether the process now followed, was also in vogue, or how and when it was introduced, is not evident; the extraction of the balsam by boiling chips of the trunk and branches is however described by most writers on Materia Medica. Monardes, whose account is the earliest, asserts that the balsam extracted in this manner is collected with shells from the surface of the water, a statement difficult to believe, as the balsam of modern times has a sp. gr. of 1·150 to 1·160. But I find that even this is capable of some explanation; for upon saturating some cotton cloth in Balsam of Peru and then boiling it in water, I was able with a spoon to collect *floating on the surface*, nearly the whole of the balsam taken. Monardes says however that the balsam was thus removed *after the cooling of the water*, an assertion which seems improbable, since *most* of the balsam, if heavier than water, sinks upon cooling.

How far the balsam obtained by boiling the wood agreed in properties with that procured after charring the bark as is done at present, it is not easy to say. It was certainly a dark fragrant liquid, which when as thick as pitch was sometimes enclosed in little calabashes,† such I presume, as may still be found in a few old collections of Materia Medica. Some of this which I have examined, is a soft solid resin, sinking rapidly in water, but rising to the surface when the water is made to boil. What the *white* balsam mentioned by De la Martinière was derived from, I know not: possibly it was the resin of Liquidambar which is still a product of the country,—possibly (though I do not think it likely) the resin from the pods of the balsam-tree.

Another point of considerable interest brought to light by Dr. Dorat's communication is that the resin (or more properly, as it proves, *gum-resin*) naturally exuded from the balsam-tree is entirely devoid of balsamic odour and taste. As my friend Dr. Attfield has kindly undertaken a few experiments upon this substance, I shall not here enter into further particulars respecting it, except to remark that its total dissimilarity from Balsam of Tolu disproves the statement of those writers who have maintained that that drug is the concrete balsam of the tree which yields Balsam of Peru.

Professor Bentley said that the paper just read was one of much interest, for although the source of our present commercial Balsam of Peru and the mode in which it was produced, had been ably investigated of recent years by the late Dr. Pereira, in this country, and by Dr. Dorat, in the district from whence it was obtained, there were still doubts in the minds of some, as to whether it might not

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* Having been unable to consult the original work, I have quoted Baily's translation, London, 1823.

† De la Martinière, l. c.

be also derived from other sources, and as to the precise mode in which it was produced. The investigations of Mr. Hanbury, and the communication and beautiful drawings of Dr. Dorat, taken on the spot where it was prepared, had entirely removed from his mind any doubts that he might have previously entertained as to the mode of production of Balsam of Peru. He noticed that Dr. Dorat had referred to two distinct substances which were obtained from the Balsam of Peru plant, *one* a natural, greenish, resinous exudation, of which a specimen was upon the table, and which possessed no evident balsamic odour or taste, and *another*, obtained after beating the bark, and described by Dr. Dorat to be of a light yellowish colour, and that from which the commercial black Balsam of Peru was prepared. He regretted that Dr. Dorat had not forwarded a specimen of the balsamic substance which thus exuded after the stems were beaten, before it was submitted to any further operations, as the changes produced in it by these operations would be a very interesting problem for the chemist to solve. It was however clear from this communication that the commercial blackish Balsam of Peru was a very different substance from that which first exuded from the bark after it was beaten. The fact that a nearly colourless balsamic substance was obtained by incision, and a blackish fluid balsam produced by heat from the Balsam of Peru plant, had been known since the time of Monardes, and appeared to have given rise to the erroneous notion, first stated by Ruiz, that the light-coloured balsam by keeping, formed the solid *Balsam of Tolu*, and the blackish liquid, *Balsam of Peru*. At the present day it was well known that these two balsams were obtained from different plants. He hoped that Mr. Hanbury would be able to obtain from Dr. Dorat, and exhibit at a future meeting some of the unaltered light yellowish balsamic exudation to which he had previously referred, so that it might be chemically examined, and its composition compared with that of the commercial Balsam of Peru.

NOTE ON THE GUM-RESIN OF THE BALSAM OF PERU TREE.

BY DR. ATTFIELD.

The naturally-exuded resin of the *Myroxylon Pereiræ*, as furnished to me by Mr. Hanbury, consists of

	In 100 parts.
Resin	77·4
Gum	17·1
Woody fibre	1·5
Water and a small quantity of volatile oil, about...	4·0

The *resin* is an acid, its alcoholic solution feebly reddening litmus-paper, and is uncrystallizable. The *gum* is similar to that of gum arabic. The *volatile oil* is limpid, colourless, and fragrant.

Submitted to destructive distillation the exudation yields an acid water, empyreumatic oils gradually darkening in colour, and a pitchy residue which ultimately chars to a cinder. It contains no cinnamic acid.

This exudation is obviously therefore a gum-resin similar, for instance, to that of ammoniacum, and though found on the bark of the tree yielding the black fluid Balsam of Peru is apparently quite distinct from the latter substance, the one having no apparent relation to the other.

NEW FEATURES IN THE SUPPLY OF PERUVIAN BARK.

BY JOHN ELIOT HOWARD, F.L.S.

A considerable quantity of medicinal bark has recently been introduced into the London market, coming by way of Pará, on the Amazons. It consists of

flat and quill bark packed in serons, and imitating to a considerable extent the *primâ facie* appearance of Calisaya bark. It is probable that, from this cause, it has excited high anticipations on the part of the importers, which are scarcely destined to be realized. The examination for alkaloids shows the same proportion to be contained in the flat and in the quill portions of the bark, evidently from the same tree; the chief difference in the chemical contents appearing in the greater abundance of chincho-tannic acid in the quills. The alkaloids weighed as first precipitated, gave in each case twenty-eight grains per 1000, the larger portion of which consisted of the quinidine of Pasteur, together with chinchonine, and a very small percentage of quinine.

The novel course which this bark has travelled suggests questions as to its origin, which can only be answered hypothetically. When Mr. Pritchett was in Huanuco in 1860, he says, "The expectations of the inhabitants were at the highest respecting the future prosperity of the city, *on account of a grand road, which was already commenced*, for connecting the province of Huanuco with the river Ucayali, the largest and most important of the southern tributaries of the Amazon." It is, then, not improbable that we have some of the first results in the present importations. It is not the first time that bark has been sent down this river-navigation of some thousand miles to the Atlantic.

The produce of the forest of Huanuco has often been attempted to be passed off for Calisaya (as I have described under the head *C. nitida* in my 'Illustrations of Pavon's Quinologia'). I have specimens of this dated as far back as 1846. In MM. Delondre and Bouchardat's 'Quinologie' will be found very full information on this subject, under the head Quinquina Huanuco plat, p. 27, also pl. iv. M. Delondre says, "No species resembles more, at first sight, the bark of Bolivia, and for a long period those who collected it sold it as true Calisaya. It is doubtless the species described by Ruiz and Pavon as the *C. nitida*, and to which they attributed a very superior quality. The surface is of a tawny yellow, uniform with longitudinal marks, less distinct than the Calisaya. The texture of the inner surface is less compact than this last. The transverse fracture is of a more pink colour, the fibres are shorter, but do not easily detach themselves. When chewed, the bitterness readily developes itself; the taste is slightly poignant without astringency." This description, together with M. Delondre's plate, accord sufficiently well with the present specimens (presented to the Pharmaceutical Museum)* to allow of its being produced by the same tree, of which (*C. nitida*) Mr. Pritchett brought back a fine but perhaps slightly varied specimen from Tingo, some thirty miles lower down the river than Huanuco, and possibly the site of the present gathering.

I think, therefore, that we must in all probability seek for the source of the present importation in the *nitida* barks of the Huanuco district. At the same time, it is not at all improbable that other species of bark may find their way, ultimately, down the numerous affluents of the mighty Marañon, even from the forests of Bolivia and of Cochabamba. The present will scarcely repay the importers. M. Delondre gives, as the result of some experience, the produce as fifteen to twenty grammes of sulphate of quinine, and eight to ten grammes of chinchonine per kilogramme; a produce which accords very well with that which I have found in the present parcel, bearing in mind that M. Delondre includes *quinidine* under the head *quinine*, as he himself tells us (pp. 30, 37),—a fact which detracts from the value of his otherwise very valuable work.

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* These specimens were exhibited at the meeting, and their characteristics briefly alluded to by Professor Bentley.

NOTES UPON OINTMENTS AND THE PREPARATION OF THEM.

BY A. F. HASELDEN.

At the commencement of the year 1862, I undertook the preparing of all the ointments, and some of the cerates, which were to form a part of the collection of chemicals, drugs, and pharmaceutical preparations, to be shown by the Pharmaceutical Society at the Exhibition; and whilst so occupied, as also since, some little matters occurred to me connected therewith, worthy as it seemed to me of particular observation; at any rate my memory was refreshed,—and the best memories require gentle jogging occasionally,—and I thought that in these thirsty days any information I had gained, and a glance at the ointments from another point of view, would not be altogether without interest to my fellow-workers in the field of pharmacy.

It may perhaps be matter of surprise, that I should have so long delayed bringing the subject forward; but the delay has only helped to satisfy me in making my remarks, and besides, to speak the truth, I have been looking for that much-coveted book, the Pharmacopœia, and imagined that I might either have more to say, or perhaps nothing at all, as probably that book would forestall me, but as it does not travel by rail and is so long upon the road, I thought I might as well try and have my little say before it came; and I may mention that though placed upon the Pharmacopœia Committee of this Society, it was not (I regret to say for my own sake) until the work, so far as that committee was concerned, was all but finished; therefore any remarks I may make are done quite in ignorance of anything connected with the future Pharmacopœia ointments and the mode of preparing them.

Amongst the thoughts which struck me upon seeing our collection in the Exhibition, were the following:—the employment of glass vessels for the ointments was an unmistakable error: the idea of being able to see them, in their variety of colour, etc., without moving them, was frustrated at an early period by the rapid action of light upon them, on which they soon became changed in their external appearance. This was particularly observable in the ointment of iodide of lead,—the front exposed to the light soon put on a leaden hue, whilst the other sides and the interior of the mass remained of the original bright-yellow. The portion protected by the ordinary white label continues unchanged to this time. Also the ointment of nitric oxide of mercury became almost black externally, whilst the inner portion remained good, and of its original colour, for more than twelve months; the iodide of mercury was protected with a covering of tin-foil, and that almost entirely retained its colour, except on the top and a small space at the bottom where it was not so perfectly covered; the ointment of iodide of potassium in the same way became yellow, and the attendant told me one day that in consequence of the change he had put it away in the cupboard below; upon my desiring to see it, knowing by previous experience what the probable result would be, he was much surprised to find that it had in retirement returned to its pristine state of whiteness. The ointment I have here was made early in 1862, but having, upon ordinary exposure, become in several places yellow or light-brown, it was wrapped in a piece of packing-paper, or whitey-brown, when it lost its colour, and has continued as it now is, almost colourless.

Again, the covers of these glass jars fitted so accurately on the tops that there was no escape for any possible moisture that might rise in the vegetable ointments, and the result was, in one or two instances, a fine crop of vegetable mould; again, the quantities were too small to make any appreciable show with the other preparations in such an exhibition. In the event of any such exhibition taking place in future, I should say, avoid glass for ointments; let them be put in some prettily-coloured earthen vessel, and let the jars be larger, even if they are not quite full. So much I gathered respecting the exhibition of ointments.

Let me now offer a few words more immediately touching the preparation of ointments. In the Pharmacopœia the quantity ordered is generally small, and ointments can be made in small quantities quite as well as in large; and an observation here presents itself, one that is often overlooked in our discussions, viz. that pharmacopœias are compiled more especially for the dispensers of medicine, rather than for wholesale manufacturers, so that every one who undertakes the dispensing of a physician's or surgeon's prescription may, if so inclined, do so with the full conviction that having made the preparations on his own premises in accordance with the published formula, he can supply exactly what is expected. It is equally true that chemicals of a definite character can be and are prepared by certain makers on a large scale in a better manner than they could be upon a small one, and in these particulars the dispenser has full permission from the College of Physicians to procure them of the best makers. But to return to our ointments, which I fear are not very interesting: nevertheless, the more uninteresting a subject may be, the more necessary it sometimes becomes to tackle it.

One of the most, if not the most, important points in the making of ointments is that they should be so prepared as to keep as long as possible, without becoming rancid; now the degree of heat used and the time the materials are under the influence of that heat, have much to do with the production of a good sweet ointment. Where wax and spermaceti are used in combination with oil, as in the Ung. Cetacei, the wax and spermaceti should be cut into thin shavings, so as to get them melted as soon as possible, and with the smallest amount of heat, not forgetting to keep the whole well stirred until cold; and where lard forms part of the compound in addition to the wax and oil, it will, in most cases, be found that the lard can be thoroughly incorporated, if put in immediately upon removing the melted wax and oil from the fire.

In preparing the Ung. Belladonnæ, which is simply a mixture of the extract with lard, it is found necessary generally to moisten the extract with a few drops of water, in order to obtain a smooth preparation. It might perhaps be advantageous in making the Ung. Conii if the form had been constructed upon the same plan, and extract had been ordered instead of the fresh leaves; for with the one a pretty definite preparation is arrived at, and can be readily made at all times, whereas with the other it can only be made at one season of the year, and at the best is not a very certain product. The Ung. Opii, again, is a simple mixture of powdered opium and lard; and if the attempt be made to mix in the dry powder, the chances are that the ointment will abound with small dark specks; but if the opium be moistened with a few drops of water and rubbed into a pasty state, it will then mix kindly with the lard, and make a good uniform ointment; and this applies equally to the Ung. Gallæ Co., only it is not necessary to moisten the powdered galls, it is better not to do so.

The next which attracts notice is the Ung. Plumbi Comp. Made in accordance with the Pharmacopœia, it soon becomes hard, and in a state quite unfit for spreading; but let the order of the quantities of lead plaster and olive oil be reversed, and we have an ointment which will keep soft any length of time, and which is in all probability quite as valuable as an ointment.

In preparing the Ung. Sabinæ it would be an advantage if the wax were omitted, as it considerably impedes the process of straining, and reduces the amount of product; and why it should be requisite in this and not in the Ung. Belladonnæ and Ung. Conii, I am at a loss to conjecture; and with the Ung. Sambuci, as the flowers can give no virtue beyond the pleasant smell, the ointment might be as well prepared by beating together, over a water-bath, some good elder-flower water and the lard,—with this advantage, that it can be made at any time, whereas the ointment of the Pharmacopœia can only be prepared at one season of the year, and is generally bad before the next comes round.

I now come to a very important part of the subject, namely, lard, which

enters into the composition of twenty out of twenty-seven of the Pharmacopœia ointments, and I tread upon this ground with some diffidence. My friend Mr. Hills gave upon a former occasion a very good process for the preparation of lard, the principal feature of which consisted in repeated washings of the flare or fat, until the skin or membrane was almost dissolved before any heat was applied.* Well, I found this quantity of ablution troublesome, as there was a difficulty in afterwards getting rid of the water, so thoroughly had it become amalgamated with the fat. The plan I have adopted for some time past, with the best result, has been this. The flare is cut up into small pieces, separating and paring off the skin, throwing the fat into cold water, and washing, by rubbing it with the hands. This is done with two or three quantities of water; it is then pressed with the hands, to squeeze out as much of the water as possible; it is placed in an earthen vessel, and submitted to a water-bath heat, either over an ordinary fire, or, which is preferable, if convenient, by means of a steam-pan. As soon as the fat becomes liquid, say, the consistence of cream,—not clear and limpid,—it is taken out and strained into a pan, and when cold the lard is cut out, and potted down in 1 lb. or 2 lb. jars; any water that was with it will be found at the bottom of the vessel. The temperature to which the fat itself is raised ranges from between 115° to 120° Fahr., the temperature of the water forming the bath between 195° and 212° Fahr. This is a simple process, requires no particular arrangement for washing, may be done upon a small scale without loss, and will cost when done 10*d.* per pound, a price at which even bad lard cannot always be bought. I believe the secret of making good sweet lard depends upon the small quantity of heat employed in the melting.

This brings me to benzoinated lard. The process for preparing this is in some measure perhaps slightly varying in every establishment, but with an equally good result, and I mention it more for the sake of making the following allusion.

I pause here for a moment to call to your remembrance the name of him who first introduced this preparation to our notice? And as each one gazes upon that beautiful representation of Jacob Bell in the hall of this house, may he be stimulated with the wish, if not with the same means, to support, as far as he is able, the honour of this Society, which has for its objects the diffusion of knowledge, the elevation, morally and intellectually, of its members, the assistance of those who have untowardly fallen into want, and the production of a kindly spirit throughout the whole body.

The late M. Moquin-Tandon mentions the employment of the resin of tolu, the waste product after making the syrup, as a preservative for lard, etc. It might do in the event of a scarcity of benzoin, but it has not the same fragrant odour, having been largely deprived of it in the process of making the syrup. I have some which has been prepared about fifteen months, but is now changed, although still retaining some of the tolu odour.

In connection with this, I may perhaps draw attention to the Ceratum Calaminæ, than which there is no ointment or cerate that becomes so soon rancid and disagreeable. Now why should not the benzoin be added to this, as well as to the zinc ointment? The only point to be overcome was the fact that oil, and not lard, was used in this case. "Let some benzoinated oil be made," said I, and in February last, nine months ago, I prepared some, of which there is a small quantity, and also a pot of Ceratum Calaminæ, made with this oil last month, and I have every reason to think it will keep in a state fit for use some considerable time. I believe it is considered a good cleansing cerate, and would be mcre frequently ordered, but for the fact that unless recently made, it is unfit for use. Although I have not yet tried, I am inclined to think it might

* This was written from memory of what was said at the Pharmaceutical Meeting, Jan. 4, 1860; for further particulars, *vide* Ph. Jour., Second Series, vol. i., No. viii., p. 399, lines 6 and 27 from top, etc.

prove useful in some of the lead ointments. I may say that I have found the benzoin a desideratum in preserving marrow, which is sometimes wanted quickly, and cannot always be procured sweet and good; and when it enters into the composition of pomades, the benzoin flavour is rather an improvement than a disadvantage. There is some on the table prepared two months ago, and I consider it has kept very well.

I have only now to thank you for your attention, and hope that I have not occupied the time in vain.

In the discussion that followed the reading of this Paper, some remarks were made on the importance of avoiding the application of more heat than was absolutely required for melting the solid fats in the preparation of ointments, it being stated that injury was often done by attempting to expedite the process of melting wax and spermaceti, without sufficient attention to the fact that some time is occupied in the absorption of the heat required for liquefaction.

Mr. HASELDEN said he was fully aware of the importance of avoiding the application of too much heat, and it was mainly with a view to this that he recommended wax and spermaceti to be cut into thin shavings; but even when this was done, no doubt some patience was required in allowing the absorption of the heat of liquefaction.

Mr. HILLS said Mr. Haselden had alluded to a communication of his on prepared lard, in which he recommended the separation of the membrane from the flare by mechanical means, and then the kneading and the washing of the fat in a current of water, to remove everything soluble in that liquid. He never contemplated, as appeared to be understood by Mr. Haselden, that the membrane was to be dissolved by the water.

Mr. HASELDEN observed that he had certainly been under a misapprehension on that point.

Mr. SQUIRE said the subject of the preparation of ointments opened several important questions, some of which had been discussed at former meetings. The mode of preparing lard, and the propriety of making this the basis of ointments, were among such questions. So many substitutes for lard had been proposed in making ointments, that the Pharmacopœia Committee had been somewhat puzzled in the selection. There was some difference of opinion also with regard to the preparation of lard. He thought any supposed advantage there might be in the washing of lard, was overbalanced by the difficulty there would always be afterwards in getting the lard entirely free from water. His experience led him to adopt a different course. He first removed the membrane, and then melted the lard by direct application of heat. If the flare was perfectly fresh, he thought there was no necessity for washing, but if it were rancid, it might perhaps do some good. When prepared without water from fresh and sweet flare, in the way he had stated, he always found it to keep very well. With reference to some of the ointments referred to by Mr. Haselden, he hoped that they would soon become obsolete, including Unguentum Conii and Ceratum Calaminæ. He believed there was no better basis for ointments than the *Linimentum Simplex* of the Edinburgh Pharmacopœia, which consisted of white wax and olive oil. He had found this to keep well for two years, but never knew an ointment made with lard to keep for more than a few months.

Mr. HASELDEN admitted that it was desirable to have the lard as free as possible from water, but he still considered washing beneficial in operating on the fresh flare. If it once became rancid, washing would be of no use, as it was impossible to wash away the rancid odour.

Mr. LAWRENCE thought the meeting was under obligation to Mr. Haselden

for the excellent Paper he had read. The discussion of practical subjects of this description, in which the members of the Society gave the results of their experiences, without reserving any secrets, afforded the best possible illustration of the advantages resulting from their association, and might at the same time serve to remind them of the late lamented Jacob Bell, who had laboured so much in promoting this object.

Mr. ALLCHIN thought it would be interesting to the meeting to know the proportion of elder-flower water used for making the ointment as described by Mr. Haselden.

Mr. HASELDEN used ℥ii of elder-flower water to ℥iv of lard. He melted the lard over a water-bath, added the water, stirred them together, and when cold separated the water, from which the lard removed the whole of the odour.

Mr. D. WATSON could confirm Mr. Haselden's statement. He had made elder-flower ointment in this way, and found it better in every respect than that made directly from the flowers.

CARR'S DOUBLE-ACTING DRUG-MILL.

Dr. REDWOOD had been requested to bring under the notice of the meeting and to explain a piece of apparatus which had been sent for that purpose from a considerable distance, by the request of a member of the Council. Mr. Haselden had adverted to the fact that the formulæ and processes in the Pharmacopœia had been drawn up with a view to pharmaceutists making their own preparations; but there was one class of preparations which retail druggists were unable to make, because there was no suitable apparatus for the purpose, and the apparatus before them was intended to supply this want. How far it

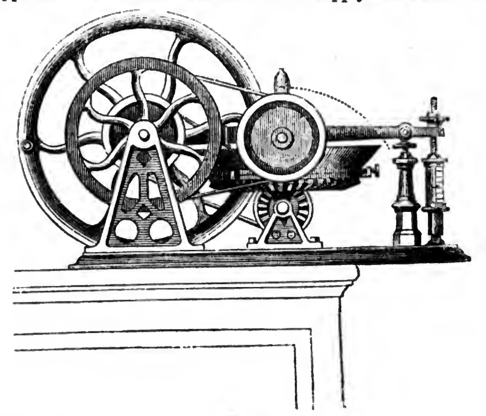


Fig. 1.

was likely to accomplish the object, it would be for them to judge. Vegetable powders, in the state in which they are now used in medicine, could not be produced by the old process of pounding with a pestle and mortar. The use of machinery on the large scale had superseded that method of operating, by the production of much finer and better-looking powders. Several at-

tempts had been made to produce an apparatus that would enable the retail druggist to prepare his own powders in the same state as they were supplied in by wholesale houses, but hitherto it could hardly be said that the requirements of the trade in this respect had been fully met. To produce a perfectly smooth and soft powder from vegetable substances, it appeared to be necessary to have the conjoined action of contusion and trituration, or to effect the result by trituration under great pressure. This was done at the drug-mills by the use of the edge-runners employed for the purpose. Mere contusion with a pestle and mortar did not bring the particles to a state in which they were equal in every direction. Mr. Carr's patent levigator professed to accomplish the object, but he (Dr. R.) had not had the means of fully testing its capabilities. In the description given by the patentee, it was stated that it comprises the advantages of two well-known mills, namely, the *Edge-Runner Mill* and the *Horizontal Mill-Stone*. The drawings represent the mill in two positions; Fig. 1 being that in which it is used, and Fig. 2, the position into which it is put for emptying out its contents. It consists of one or two edge-

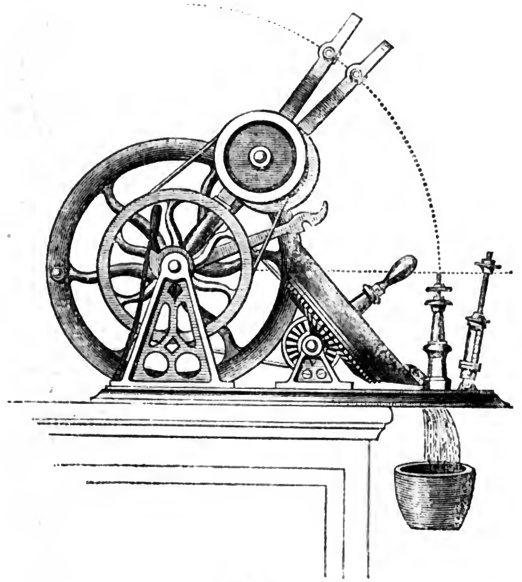


Fig. 2.

runners working in a pan which forms the bed-plate. Both the runners and the pan are made to rotate, but with unequal velocities, although in the same direction, and the effect of this is the production of a very efficient triturating action. In the small mills, such as the one before the meeting, the runner and the pan were made of Wedgwood ware, but in the larger mills they were of

cast-iron. The want of weight in the stone-runners was compensated for by a spring, which could be so adjusted as to give any required amount of pressure.

PHARMACEUTICAL SOCIETY, EDINBURGH.

The First Meeting of the present Session was held in St. George's Hall, on Thursday evening, 19th November; Mr. G. BLANSHARD, President, in the chair.

There was a very full attendance, including Bailie Alexander, Dr. James Young, Dr. Sanders. etc., etc.

The PRESIDENT delivered the following Address:—

Gentlemen,—It is my duty as well as pleasure, being President of the Society, to welcome you all on this the first meeting of our present session. It is not my intention to detain you long with the following introductory remarks, but as it has been the custom of my predecessors in office, you will, I doubt not, give me an opportunity of saying a few words.

During the summer recess there has not been much to engage the attention of the pharmaceutist, beyond the interest which always attaches, more or less, to the daily avocations of those engaged in the manufacturing and dispensing of chemicals and drugs. Several new remedies have, it is true, made their appearance, while as remedial agents we can point to podophyllin, and a few other substances. which have become decided favourites, and are now established as such in the hands of medical practitioners. Granulated preparations occupy a long list, and furnish us with the means of giving substances, many nauseous in themselves, in a manner at once novel and elegant. In the higher range of Scientific Chemistry, talent and ingenuity have been alike displayed, every month adding to the long and interesting list of elementary and other bodies. But in connection with our own particular walk, I may be allowed to refer more especially to the formation of a new association, and which lately held its first or preliminary meeting at Newcastle, under the name and title of the Pharmaceutical Conference. It is quite true, that our own Society had capability enough to have undertaken the work which the new Association proposes to follow out; but as it has not done so, and as the field is still open, a commencement is about to be made on a wider basis, and it remains to be seen whether or not the exertions of its members will be crowned with success. Certain it is that the kindred association on the other side of the Atlantic, and which originated in 1821, has been most successful, resulting, as it has done, in the establishment of schools, as well as a college of pharmacy; while the annual meetings in different districts throughout the United States, have been rich in the elucidation of much that has been interesting, useful, and important. I understand that one of the leading features proposed by the new institution, will be the study and examination of various subjects of much practical value, the results of which will form the principal business to be discussed at the annual pharmaceutical meetings. The Journal has intimated the organization of the Association; and as members are about to be enrolled, those desirous of connecting themselves with it have now an opportunity.

From what is to follow this evening, I must not prolong these remarks; permit me however to refer to the contributions to our museum, now before you, and which have been presented by our parent Society. For these I am sure you will join in heartily thanking the Council in London, for the kind remembrance of the Society's branch in the North.

The Library is now in complete working order, and attendance will be given by the Curator every other Tuesday evening in the Hall here at 9 o'clock, for the purpose of giving out books and periodicals. We are anxious that all, especially the younger members of our Society, should take advantage of this very excellent collection of volumes, which they have now the privilege of using.

The Council are very desirous that the scientific meetings about to commence, should be as interesting as possible, and they invite any one disposed to aid in this matter to come forward with such communications as will form food for the regular monthly meetings throughout the winter session.

I may only further add, that I shall be most happy to award a prize to the author of the the best essay on any chemical or pharmaceutical subject, which may be written during the winter. Competing papers to be sent not later than the 1st March, 1864, with sealed envelopes, to the care of Mr. John Mackay, the Secretary, 119, George Street.

Allow me in conclusion to say, that while I am deeply sensible of the honour you have conferred upon me, in placing me in this chair, I must throw myself upon your kind forbearance, in any shortcomings, which I fear will be many; assuring you at the same time, it will be my utmost endeavour, to the best of my ability, to discharge the various and onerous duties attached to the office of your President.

Dr. Stevenson Macadam will now add to the deep obligation under which we already lie to him, by giving us an address, which I doubt not will be, as all his contributions to our meetings have ever been, full of instruction and interest.

Dr. Macadam then read the following Paper on

THE RECENT PROGRESS OF ORGANIC CHEMISTRY.

Dr. MACADAM mentioned that the department of organic chemistry had made great advances during recent years, not only in pure chemistry, but in the relations of that science to the industrial arts. He stated that not only does the manufacturing chemistry of the age transform starch and sugar into alcohol by fermentation, as in brewing operations; sawdust into oxalic acid by the action of soda and nitre; starch or sawdust into grape-sugar by the aid of sulphuric acid; wood and coal into paraffin and paraffin oils by the process of destructive distillation; coal into aniline and the coal-tar colours; and guano into a magnificent colour, rivalling that from the cochineal insect; but the organic chemistry of the day has proceeded to produce artificially many alcohols and ethers, including jargonelle pear essence and pine-apple essence; and to construct many alkaloids resembling quinine, strychnine and morphine in their composition and chemical properties, encouraging the hope that we may soon be in possession of the means of preparing by artificial processes these powerful medicines, and possibly others equally efficacious, but which Dame Nature has never dreamed of presenting us with in a ready-formed condition.

And more than that, and principally through the researches of Berthelot, dead mineral matter has been worked up by stages into organic compounds. Thus Berthelot, taking carbon and sulphur, combines these into bisulphide of carbon, a mobile ethereal liquid; and thereafter, by the mutual reaction of copper, hydrosulphuric acid, and the bisulphide of carbon, he obtains olefiant gas. The latter is absorbed by sulphuric acid (oil of vitriol), to the extent of 120 volumes of the gas in one of the acid, and thereafter by dilution with water and distillation, the acid mixture yields alcohol of the same composition and properties as that obtained from ordinary grain. Strecker takes the olefiant gas in solution in sulphuric acid, and by adding water, neutralizing with ammonia, evaporating and heating, obtains crystals of taurine, one of the constituents of bile. Wöhler combines the simple elements, nitrogen and oxygen, by electric discharges into nitric acid, and then by the successive mutual reaction of this nitric acid with tin, hydrochloric acid and black lead, and lime (or oxide of lead), he obtains a complicated organic substance, called the hydrocyanate of ammonia. The latter may also be prepared by passing a mixture of the gases ammonia and carbonic oxide through a red-hot tube. The hydrocyanate of ammonia may then be employed in yielding cyanogen, hydrocyanic acid (prussic acid), oxalic acid and urea; also formic acid, paracyanogen, cyanuric acid, sulphocyanogen, and mellon.

When cast-iron (which contains carbon) is dissolved in dilute sulphuric or hydrochloric acid, there is evolved a volatile oil resembling turpentine, and there is left in the vessel a small quantity of graphite, and a brown mould resembling vegetable mould. Ordinary carbonate of soda (washing soda) can have carbon abstracted from it, and if the latter is acted upon by dilute nitric acid, and the solution evaporated, an artificial tannin is obtained, which has the property of precipitating gelatine or glue from its solution, like ordinary tannin obtained from gall nuts or oak bark. Berthelot has taken carbonic oxide and caustic potash, and compelled them to produce formic acid (yielded naturally by red ants); and with a single link of the chain awanting, he has manufactured glycerine, which is the base of fatty substances, and combining it with the fatty acids, he has prepared artificially the oils and fats generally obtained from the plant and the animal, and many more new oils and fats not known in nature. Berthelot has acted upon glycerine by putrefying animal matter, and obtained artificially grape sugar; and has converted oil of turpentine into ordinary camphor and Borneo camphor; whilst in conjunction with De Luca, he has prepared artificially one of the chief constituents of oil of mustard (sulphocyanide of allyl).

These researches in organic chemistry may appear, at this the moment of their birth, to have little influence on the arts and manufactures and on mankind in general. But are they not researches into the deep mysteries of nature? and who can predict the influence which they may yet have on the prosperity of the human race? The discovery of an ethereal substance by Soubeiran, in 1831, who named it éther bichlorique; by Liebig, in 1832, who called it chloride of carbon, and thereafter by Dumas, in 1834, who gave it the name of chloroform,—did not foreshadow the application of that agent in alleviating human suffering, so nobly suggested by our esteemed fellow-citizen Professor Simpson. The discovery of aniline in 1826, by Unverdorben, coupled with the discovery of benzol in oil gas, by Faraday, and the detection of it in coal-tar naphtha, by Mansfield; and thereafter the discovery of the conversion of benzol into nitro-benzol, which in its turn could be converted in aniline, lay dormant till the year 1856, when the researches of Mr. Perkins showed, that these discoveries contained the germs of the coal-tar colours, and yielded us the unrivalled colours, mauve, magenta, purples, reds, violets, besides blues, greens, and even blacks.

Dr. Macadam then made special reference to the influence of Gerhardt's system of notation and equivalents upon the mode of representing the compositions of organic as well as inorganic substances, and discussed the arguments in support of the doubling of the equivalents of oxygen, carbon, silicon, sulphur, selenium, tellurium, titanium, and tin. He explained the principal points connected with the classification of substances, according to Gerhardt's views, and concluded by expressing the opinion that the time had now arrived for a more systematic consideration of the whole subject in the lecture-room, so as to prepare the student of chemistry for the change in chemical notation and nomenclature which must apparently take place in a few years at most.

A discussion took place after Dr. Macadam had read his paper, in which Dr. Sanders and others took part.

A vote of thanks was proposed by Bailie Alexander to Dr. Macadam for his very able and instructive paper, to which he was sure all had listened with much pleasure. This was seconded by Mr. D. R. Brown, and cordially carried.

Mr. MACKAY described and showed in operation one of Carr's New Patent Levigators, or double-acting Composite Mills, for grinding drugs and various other articles. This machine was examined by several parties present, who all expressed their approval of the arrangements, and considered it, for the size, the best mill they had ever seen. Thanks were voted to Mr. Carr, of Birkenhead, the inventor, for his kindness in sending the mill to be shown.

The arrangements for the winter session regarding the Library were then announced, as well as intimation made regarding the President's and Register Fund Prize. These Prizes are open for competition in England and Scotland, to all connected with the Pharmaceutical Society. Competing papers must be sent with sealed envelopes to the Secretary, 119, George Street, on or before 1st March, 1864.

Various specimens sent by the Society in London for the Museum in Edinburgh were laid on the table, and some of them viewed with interest. In accordance with the President's suggestion, thanks were awarded to the Council in London for their presentation.

The meeting thereafter adjourned.

Edinburgh, 20th November, 1863.

PROVINCIAL TRANSACTIONS.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Liverpool Chemists' Association held its Second General Meeting of the session at the Royal Institution, on October 23, 1863; Mr. J. SHAW, President, in the chair.

Mr. FREDERICK BUCKLEY was elected a member.

Mr. TURNER exhibited a very curious membrane which had been found formed in the bread-bin of a ship on its voyage from New Zealand to France. The strength and delicate beauty of the fabric excited much interest.

Mr. Abraham, in presenting to the Museum specimens of the *Physostigma venenosum*, —the ordeal bean of Old Calabar,—gave an account of the plant and its properties. He exhibited drawings, kindly lent for the purpose by Dr. Nevins. 1st, of a young plant growing in the garden of James Leisham, Esq., produced by a seed which was known to have been in Liverpool about nine years, and which resembled one now in the Botanic Garden, presented by the Rev. Mr. Thompson, lately a missionary in Old Calabar. 2nd, of portions of the plant in more advanced stages of its growth. Mr. Abraham stated that seeds newly brought from Africa, which he had presented to the Botanic Garden, and seeds which Mr. Tyerman had obtained from another source, had not germinated after the lapse of several months from the time they were planted. He described the therapeutical effects of the bean, and the modes in which it had been exhibited. He said that an extract, made by exhausting the powdered bean with alcohol, evaporating the spirit, and mixing the solution with a mixture of one part of glycerine with three parts of water, had given entire satisfaction to the oculists to whom he had supplied it. It did not irritate the eye, did not spoil, and was preferred by them to paper soaked in the extract. He said that the seeds were at present scarce in this country, and not to be obtained from ordinary commercial sources; but it was probable that they would soon be plentiful, and as they possessed properties of a very poisonous and insidious character, it was very desirable that they should not fall into improper hands.

Dr. J. B. Edwards exhibited a number of beautiful electrical discharges *in vacuo*, in illustration of their applicability to telegraphy, and the transmission of signals at sea, and on railways, and to miners' lamps.

The cordial thanks of the meeting were accorded to Mr. Turner and Mr. Abraham, and to Dr. Edwards, for their valuable discourses.

The third meeting of the session was held on Nov. 5, at the Royal Institution; the President in the chair. Ladies having been specially invited to this meeting, a large number were present.

The following gentlemen were duly elected Members:—Messrs. T. Lloyd and W. T. Stanton. As Associate, Mr. Henry Shore.

Various donations to the library were announced, and the books purchased by the Council for the library were on the table.

Dr. Edwards delivered a very lucid lecture on "Spectrum Analysis," demonstrating the subject with brilliant experiments and projections by electric light of the spectra of copper, zinc, thallium, sodium, and other elementary substances; the characteristics of which were beautifully delineated upon a screen twenty feet in diameter.

Dr. Nevins moved a vote of thanks to Dr. Edwards, for his very successful demonstration of this interesting subject, and the audience testified their approval by hearty applause.

The fourth meeting of the session was held at the Royal Institution, on the 19th November; the President in the chair.

Messrs. Robert Morgan, A. Willers, W. Challieu, and H. Jones were duly elected Members.

The following donations to the Library were announced:—'Correspondence between Dr. Inman and Professor Hamilton, on Gaseous Exhalations and Miasmata as a cause of Nuisance,' etc., from the authors; the Proceedings of the Liverpool Architectural Society, and of the Polytechnic Society, from the respective Societies; and the 'Chemist and Druggist' for November, from the editors.

The Secretary announced the resolution of the Council, with Dr. Edwards's concurrence to open a Practical Pharmacy class, on the afternoons of Tuesday and Fridays, from three to five o'clock, to which pupils connected with the Association will be admitted on the usual terms.

The Secretary read the following communication from Professor Hamilton, of Queen's College, Liverpool.

"Queen's College, Liverpool, 15th Nov. 1863.

"Dear Sir,—I had a conversation with Dr. Waters some time ago, about an interesting case of chylous urine which he had under his care, and I informed him that if Delarue's parchment paper was a fair specimen of a colloid, I had succeeded in causing a colloidal solution to pass through a colloidal membrane, and that this circumstance might have some bearing on the occurrence of chyle or albumen in urine.

"I have since repeated the experiments with solutions of egg-albumen and gelatine, and I find that these substances do pass through the dialyser.

"The particulars I will be glad to explain to you at any convenient time.—I am, yours very respectfully,

"GEORGE HAMILTON.

"H. Sugden Evans, Esq., Secretary, Chemists' Association."

The thanks of the meeting were accorded to the donors to the Library, and to Professor Hamilton for his valuable communication.

Mr H. Sugden Evans then read a short paper "on some of the recent additions to the Museum."

Mr. BANNER explained by the aid of a model, Holt and Banner's method of storing petroleum in wells of water. This led to an animated discussion, in which Messrs. Mercer, Shaw, Murphy, Bird, and Abraham took part.

After the usual votes of thanks, the meeting separated.

LEEDS CHEMISTS' ASSOCIATION.

The Second Ordinary Meeting of the Association for the session, was held at the Town Hall, on Wednesday Evening, Nov. 11, 1863; the President, Mr. Harvey, in the chair.

Mr. REYNOLDS, F.C.S., read a paper upon "Bees'-Wax and its Adulterations," of which the following is a report.

The animal kingdom now contributes but few products to the lists of our Materia Medica. The class Insecta is represented by three of its members, viz. the Spanish fly, the cochineal insect, and the honey-bee, *Apis mellifica*, the source of the substance to be considered. Before speaking of the chemical properties of bees'-wax, it was right to allude briefly to the natural history of the subject. The study of Materia Medica owes its chief charm to the student, in thus bringing him into contact with the natural history sciences. In the investigation of these, he finds a more elevating and unselfish intellectual influence than in the acquisition of a knowledge of the applications of science. The late Dr. Pereira, when lecturing, would constantly diverge from the practical and technical treatment of his subject, to follow up minutely some apparently trifling point in natural history. The time which he devoted to such subjects as the structure of a hen's egg, or to the microscopic structure of chalk, are illustrations which will be recalled by his old students.

Bees'-wax was long supposed to be merely the pollen of plants, elaborated and condensed by the bee,—an error which is refuted by the fact that wax is produced freely when the insect is fed upon honey or sugar only. Of the three classes found in a colony of bees, the secretion, etc., of wax and honey devolves upon the working bees, which are females having the ovaries imperfectly developed. These workers have eight scales or pouches on the abdomen, which secrete the wax. After being elaborated by the action of the jaws and feet, a fine ribbon of wax is produced, and used for building up the honeycomb. The structure of this has excited the interest of the most profound philosophers, who have made it a subject for elaborate investigations. It is only needful to name Lord Brougham's essay in his "Dissertations on Subjects connected with Natural Theology." The form of a honeycomb is, as is well known, that of a double series of hexagonal cells, placed as it were back to back. It is this hexagonal form that has attracted the especial notice of mathematicians, who have demonstrated that this shape requires the least amount of material in order to yield a given strength: and further, that a larger number of cells can be put into a given space than if any other form were adopted. That *circular* cells would have wasted far more space is manifest. Many and ingenious theories have been set up to explain why the bee should make hexagonal cells,—the peculiar nature of the insect's eye, an impression made upon its antennæ, etc. etc., being some of the latest "guesses at truth." However, though the subject well deserves and will undoubtedly repay a continued inquiry, we may regard the following as the most probable statement of the case. The bees construct a series of thin *cylindrical* tubes, but the crowding of a maximum number into any given space makes their walls

press upon each other, and under this pressure (equally and gradually exerted) they take the form of hexagons. Darwin, in his 'Origin of Species,' describes experiments which prove the originally cylindrical form of the cells. It almost causes regret to have to abandon so long-cherished an idea as that of the exposition of the instinct of the bee, as shown by the form of its cells.

After treating of the chemistry of wax as demonstrated by Brodie, and of the process of bleaching, allusion was made to varieties of wax derived from other sources than the bee, these being the following:—

1. *Insect Wax of China.**—The larva of an insect of the cochineal family is covered by a waxy secretion, which is communicated to the trees upon which it lives, from whence it is collected.

It resembles good block white wax, and has very little odour. Its price is about 2*s.* 8*d.* per lb.

2. *Japan Wax.*†—For some years past occasional importations of a peculiar wax have taken place from Japan indirectly, by way of Singapore and China: hence "China wax" is a synonym sometimes used. Usually this wax is in circular cakes of 4 to 5 inches diameter, having evidently been moulded in a small saucer. They exhibit a white efflorescence. Since the opening up of trade with Japan, much larger quantities have been imported, and in a different form, viz. as large square blocks packed in chests which hold about 130 each.

This wax is derived from a vegetable source which appears to be the berries of *Rhus succedanea*, a tree known in our greenhouses. Travellers in Japan had long since stated that by boiling and expression, such a substance was obtained from these berries.

It has a shade of yellow, is crumbling, and has a rancid smell and taste. With alkalies it is saponified, being an important difference from the behaviour of bees'-wax under similar conditions. Its price is at present 10*d.* per lb.

3. *Carnauba wax* is a waxy secretion found on the lower surface of the leaves of *Ceroxylon Carnauba* and other Palms growing in Brazil. It reminds us more of a resin than a wax, being hard, brittle, and buff-coloured. Its melting-point is high, viz. 192° Fahr. Its price is 10*d.* per lb. Mr. Proctor has reported it as suitable for furniture polish, either alone or mixed with other wax.

Myrtle wax and some other similar vegetable products cannot be said to be known in commerce, and may be passed over.

Adulteration.—In an article upon the adulteration of wax which Mr. B. S. Proctor recently published ('Chemist and Druggist,' January, 1863), he commenced by saying, "Wax, both in its bleached and unbleached conditions, is much subject to adulteration; so much so, that the purity of foreign yellow wax is always considered as very doubtful, and the impurity of white cake-wax is generally looked upon as almost certain." We must admit that this sweeping assertion contains too much truth. However, the object of the present Paper has been less to give the result of investigations as to the purity of particular samples, than to ascertain what methods of examination were reliable and convenient.

Mr. Reynolds acknowledged the valuable aid given by his pupil, Mr. Clayton, to whose intelligence and zeal he was indebted for conducting the experiments which had been made. To a fellow-member of the Association, Mr. Brown, he was under obligations for pure wax, melted by himself from Irish comb, and this had been taken as a standard.

The most convenient way of considering the experiments made, is to take each method separately, and note its merits and demerits. In each experiment thirty grains of wax has usually been employed.

1. When pure bees'-wax is digested in hot oil of turpentine, it dissolves almost entirely. If resin, carnauba wax, Japan wax, etc., be present, they will also dissolve; but farinaceous or mineral adulterations of any kind would be detected, since these substances would be left behind. Of course, merely melting the wax and allowing insoluble matters to deposit, will equally detect such sophistications.

2. The alcohol test for resin. Since only the cerolein of bees'-wax is soluble in alcohol, and this does not exceed 5 per cent., we have a ready test for resin. If cold alcohol re-

* Pharmaceutical Journal, vol. xii. p. 476.
† Pharmaceutical Journal, New Series, vol. i. p. 176.

moves more than 5 per cent. from a sample of wax, it may be set down as containing resin. Spermaceti, paraffin, and carnauba wax lose very trifling amounts; stearic acid loses nearly two-thirds.

3. The ether test for Japan wax, spermaceti, stearic acid. (Chem. N. vol. v. p. 170.) M. Robinaud says that pure bees'-wax treated with fifty times its weight of ether, leaves just fifty per cent. residue.

Experiments.—Thirty grains treated with ether.

	Residue.
Nos. 1 & 2. Standard bees'-wax	16·6* in each case
3. Block white wax	15·0
4. Cochin „ „	15·4

The author's statement as to the behaviour of genuine wax is consequently correct.

To proceed further, he states that suet, stearic acid, and vegetable wax dissolve almost entirely in ether, and that vegetable wax leaves only five per cent. insoluble.

Experiments.—Thirty grains Japan wax.

		Residue.
30 grains	(Block) "G"	11·5
„	(Block) "B"	10·8
„	(Cake) "H"	8·2
„	Spermaceti ...	0·
„	Stearic acid ...	0·
„	Carnauba wax	26·7

Here a discrepancy is apparent between these results and the statements of the author.

Experiments with mixtures.

		Residue.
30 grains of wax + Japan wax	=	9·6
60 40		(*vice* 9 grs.)
30 grains of wax + stearic acid	=	6·3
60 50		(*vice* 7·5)
30 grains of wax + spermaceti	=	11·
80 20		(*vice* 12)
30 grains of round cake-wax	=	3·3

It is especially interesting to note that the discrepancies so striking when the adulterant substances only were treated with ether, are much mitigated when mixtures of these matters with pure wax are the objects of inquiry.

With each result is stated the amount that should have been left, if M. Robinaud's test had been quantitatively reliable. Of course, in all these cases had pure wax been the object examined, the residue would have been fifteen to sixteen grains. The results obtained would justly have condemned every specimen. The instance of round white wax especially deserves notice. The test would indicate only twenty-two per cent. of pure wax (!), and seventy-eight of something else. Other tests show that this is spermaceti. It is not stearic acid, the so-called "stearine" of trade. But the test is not quantitatively absolute. A mixture of pure wax with either spermaceti or Japan wax, does not behave the same as if they were separately treated by the same solvent. When spermaceti is present, less residue is obtained from the portion of genuine wax than should be the case.

With Japan wax, the amount of adulteration is correctly shown, and the Japan wax is really dissolved without residue, although in its pure form it left thirty to forty per cent. This has apparently escaped the author, but it affects the value of the test vitally. The fact that such substances may re-act when they meet in the presence of a solvent must be recognized in future. Still, the ether test appears to be one of very great value, detecting nearly all adulterations qualitatively, and giving approximate ideas of their amo nt.

4. *Borax test.*†—Hager states that the presence of Japan wax may be detected by its behaviour with a boiling solution of borax. In such solution, bees'-wax is nearly

* This tested for sugar, left ·4 per cent. of Sugar.

† Chem. News, vol. v. p. 84.

unacted upon. (Experiment.—10 per cent. was found to dissolve and separate on cooling.)

Japan wax dissolves up entirely, and forms a gelatinous mass on cooling. (Experiment.—A mixture of the two showed the Japan wax readily, but as it dissolved an extra quantity of the bees'-wax, it is not good as a quantitative test.)

5. *Alkaline test* for determining stearic acid in wax, by Overbeck.*—A solution of dried carbonate of soda (1 to 50) is the reagent. About 6 ounces of this are boiled with 15 grains of suspected wax for two minutes, and allowed to cool. Pure wax leaves a clear solution, but stearic acid froths, and gives a gelatinous soap.

Expt.—15 grains	Pure Wax	Clear liquid.
	Wax + 5 per cent. stearic acid,	Solid jelly.
	Wax + 2 per cent.	Gelatinous liquid.
	Cake Wax	Little milky.

Thus far the test is excellent, and detects 2 per cent. of stearic acid readily; but the author goes further, and claims for it a quantitative value.

He directs as follows:—Add alcohol, which throws down the wax in insoluble flakes, and leaves a jelly (stearate of soda soap), which dissolves afterwards in the alcohol, and forms a filtrate which passes through calico, upon which the residual wax is weighed. Experiments made with this modification of the test, caused the conclusion that it was totally impracticable.

6. *Lime-water as a test for Stearic Acid.*†—M. Regnard proposes boiling suspected wax with lime-water, in a flask nearly closed from the air, and notes if an insoluble stearate of lime is formed.

This test is open to many errors of experiment, from carbonate of lime being mistaken for the stearate, and must be superseded by the excellent soda-test.

The PRESIDENT expressed the pleasure with which he had listened to the Paper. The experiments detailed appeared to him to contain practical information of considerable value, and many of the facts which they recorded were as new to him as to any person in the room.

Mr. ATKINSON wished to know if Mr. Reynolds had tried any process in which chloroform was used as a solvent. This process has been described as follows, by its author, M. Vogel:—The wax is treated with 6 or 8 parts of chloroform; if genuine, it loses 25 per cent., but if fatty matters, like stearin, be present, they will also dissolve, and the loss will be greater.‡

Mr. WARD said that he believed the chief means of adulteration employed was Japan wax. That sophistication was a common practice must be self-evident when looking at the price at which wax was constantly offered, viz. from 1*s.* 1*d.* to 1*s.* 4*d.* per pound. He had recently seen some which a person had got up for sale, consisting entirely of Japan wax, coloured by gamboge. Carnauba wax was a very peculiar substance, and only one per cent. mixed with bees'-wax would destroy the grain; consequently he did not think that it was used for this purpose.

Mr. BROWN was much impressed with the importance of studying the reactions of different samples of pure wax. This country was now supplied with wax from countries varying in every degree as to temperature and general climatic conditions, and it was impossible but that these influences should affect the wax. Even in the same country, the nature of the season, whether wet or fine, appeared to him to produce differences in the physical characters of both honey and wax, which were of no trifling importance. He had observed that a wet and cold summer gave a more liquid honey and a harder wax than was obtained in a hot season. He thought we should investigate these differences more fully.

At the conclusion of the ordinary business, an extraordinary meeting was held, according to notice, in order to alter Rule 4, by constituting the Honorary Librarian a member of Committee. This amendment was unanimously carried.

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* Pharm. Journ. vol. ix. p. 128.
† Pharm. Journ. vol. iv. p. 177.
‡ Journ. de Pharm. et de Chim., vol. xvii. p. 374.

ORIGINAL AND EXTRACTED ARTICLES.

NOTE ON THE PREPARATION OF OINTMENTS.

BY MR. JOSEPH INCE.

The facility with which ointments in general may be prepared has led to some disregard as to the care required in this branch of practical pharmacy. The Society is therefore indebted to Mr. Haselden for having brought the subject prominently before its notice. One essential point may yet be mentioned, namely, the importance, amounting often to the necessity, of filtration, whether direct or indirect.

No vegetable ointment, that is compound of fat and a vegetable substance, should be allowed to leave an English Pharmacy without having been previously filtered through a steam-funnel. So great is the advantage gained in the appearance, as well as in the subsequent keeping of the ointment, that this finishing process cannot be too strongly urged.

The Unguentum Sambuci is directed to be made with equal weights of Elder-flowers and Lard. Boil the Elder-flowers in the Lard until they become crisp; then press through a linen cloth. However carefully it may thus have been prepared, enough water, or vegetable matter, or both, remains to effect the speedy decomposition of the ointment. It becomes rancid, changes colour, and may fitly be termed an inelegant preparation. But if, instead of arresting the process one stage too soon, the whole mass is filtered through the steam-funnel, a wonderful change is effected; the colour is materially improved, the scent of the Elder-flower is developed, and the ointment will remain in a state of perfect preservation during any reasonable space of time; nor when so treated am I aware that any desirable alteration could be suggested.

The Unguentum Conii (not in great repute) is ordered to be made from equal weights of fresh Hemlock-leaves and Lard. Boil the Hemlock in the Lard until it becomes crisp; then press through linen. The result we know is most unsatisfactory; the colour obtained being its least recommendation. Pursuing the same plan of subsequent filtration, we obtain at once an elegant, though possibly a not very useful ointment.

By the adoption of this method two distinct things are gained,—first, a bright attractive appearance; and, secondly, a perceptible improvement in the preservation of the compound.

I can scarcely imagine any establishment where steam-power is used not availing themselves of this simple but efficacious plan.

I should mention that where no such apparatus is at hand, a very little ingenuity exerted in connecting gutta-percha tubing with an ordinary domestic boiler, or even with a tolerably capacious kettle, and allowing the steam generated to pass through a jacketed tin funnel, would be amply sufficient for the purpose.

The cost of such a piece of mechanism would be under five shillings.

There are however several ointments, and specially those used in dispensing, which from their nature do not admit of this direct filtration. No ointment could be thus treated containing an insoluble metallic active principle, such as Unguentum Hydrargyri Iodidi, Unguentum Plumbi Iodidi, or Unguentum Precipitati Albi; because in all such cases the fat would filter through, and leave behind the very ingredient on which the value of the ointment rests. A large slab should be selected, over which is drawn a square of rather coarse muslin. The ointment having been properly prepared, either from prescription or from a Pharmacopœial formula, is worked through the muslin by the aid of a bone spatula (the muslin being twisted up from the four corners to make a bag). There is no

comparison between an ointment so manipulated and one that has only received the ordinary care of the dispenser. In some instances it would be difficult to persuade even an experienced eye that the two ointments made from the same materials, and with equal care, could be identical.

Lastly, Lard is the basis of most ointments, and therefore by bestowing proper attention to the base, we can materially alter the appearance of even those ointments which are not capable of direct filtration.

The Pharmacopœial description of the substance to be used is Adeps præparatus. "Qui Sodii Chlorido conditus fuerit, is non adhibeatur." It is obvious that we cannot expect first-class preparations by the employment of the mere commercial article as retailed in the shops.

I have grounds for thinking that the use of water in *preparing* Lard is neither essential nor desirable, but that its purification may be thoroughly effected by the aid of heat. This being an open question, I leave it as it stands. But with regard to another point I am most certain, that in whatever way Lard may have been purified, it is changed into a beautiful preparation by filtration; and having been once carefully filtered, it may stand its ground against the whole series of fanciful amalgams that have been from time to time suggested as a substitute.

26, St. George's Place, Hyde Park Corner.

MICROSCOPIC GROWTHS IN PHARMACEUTICAL INFUSIONS, ETC.

BY MR. CHARLES SYMES.

Although microscopists have frequently called attention to the appearance of organic forms in both vegetable and mineral solutions, the ordinary observer does not usually seek for signs of change in these, previous to the appearance of mould on the surface, or an abnormal odour and taste.

Now the presence of most Algæ might readily be detected by the naked eye, although their structure could not be ascertained without the aid of that valuable instrument the microscope; such is the nature of those to which my attention has been attracted. If either of the subjoined infusions is set aside for a few days, or a week, (according to temperature,) there will be found floating near or attached to the bottom of the containing vessel one or more small globular structures.

Inf. Rosæ Co., Inf. Gentianæ Co., Inf. Rhei, and Inf. Calumbæ, are those in which I have observed them, but they probably occur in many others. They consist of a number of fine silky filaments radiating from a common centre, are usually separate and symmetrical in form, but occasionally the filaments of two are seen united; this is the appearance to the unaided eye.

Take now one of these Algæ and examine it under the microscope with a one-inch object-glass; it is found to form an irregular network in the centre, and this contains a number of small bodies, which I at first thought to be nuclei, but on further examination they appear to be a collection of particles of the solid ingredients which pass through the interstices of the filtering wool, when the infusions are strained. The filaments are usually articulated,* more or less branched, and extending to delicate fibrillæ. If the solid bodies in the centre are irregular in form, the alga is unsymmetrical; thus they appear to influence the growth, although forming no essential part of it.

I hoped to prevent (or at least to relax) their formation by filtering the infusions through paper; this proved ineffectual—they were produced with great facility, but *without* solid particles in the centre.

* Some of the articulations are not seen with less than a quarter-inch power.

In addition to the above infusions, I might mention that they readily form in a weak solution of citrate of iron and quinine, when kept in a vessel imperfectly excluding the air, and placed in a warm room; indeed I have known them form in a mixture (to the astonishment of the patient) when kept longer than it should have been.

These growths must frequently have come under the notice of the Pharmaceutist, and perhaps some of those who are microscopists will be able to furnish further particulars respecting them; also the conditions *least* favourable to their development, one of which I presume to be low temperature.*

AGE OF CANDIDATES FOR THE MAJOR EXAMINATION.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—In the August number of our Journal the question is asked, and has been asked before, how it is that, after the Society has had a twenty years' existence, Pharmaceutical Chemists bear so small a proportion to Druggists in general.

May I attempt a reply by asking another question? Why are our Associates virtually excluded from the Society, by being prevented from passing the Major before they are twenty-one years of age?

Take a case in point. (I know of three.)

A young man (from the country, perhaps) passes his preliminary, and is registered. At the age of eighteen or nineteen he goes in for the Minor, and succeeds. After a run home for a week, which his principal is very pleased to afford him, that he may air his new distinction, and receive encouragement from his friends (who never withhold it, if they are wise), he returns to his work, like a young giant refreshed, and six months later, perhaps, is ready for the Major. But a difficulty awaits him. He is told it cannot be done by a sapling; he must have attained the vigorous age of twenty-one. Now, probably he was apprenticed for four years at the age of fifteen, and at nineteen has served his term. What is he to do? He cannot remain idle, so he takes a situation, and then "Farewell, a long farewell, to all his greatness!" Why? Well, he begins work at seven, or half-past, finishes at nine, if he is lucky—if unlucky, at ten, eleven, or twelve. "Books are excluded during business hours," so he probably forgets a good deal of what would have been useful for the Major, and being in the country, perhaps, he may not be able to afford the expense of coming to apartments in London; nor may he succeed in getting accommodated with board and lodging in lieu of services, so he looks forward to the lucky time (as he believes) when he will be able to go into business for himself, and that time having arrived, he wants to know what good the Society is to him. He does not care to stick up Associate over his door. He may not call himself a Pharmaceutical Chemist, nor can he hope to become one, as henceforth he will have no time to do aught but earn a living, so he calls himself "Chemist and Druggist," and is lost to the Society for ever.

Anticipating the usual objections to this view, I appeal to the experience of my brethren if there is anything unfair in my way of putting it; and if it be true, I need not suggest the remedy, although, by the constitution of our Society, I believe it difficult of application.

Another question has also presented itself from time to time, viz. the status which the Society gives us in public estimation.

The following incident occurred in my shop some time since, and it is but one of several:—A gentleman requested me to prepare a prescription, with the re-

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* Our correspondent will find some valuable papers "On Microscopic Vegetations developed in Pharmaceutical Liquids," by the late Dr. Pereira, in the 7th and 8th volumes of the 'Pharmaceutical Journal.'—Ed. Ph. Journ.

mark, that the case was an important one, and he had come a considerable distance, "because he was told I was a Pharmaceutical Chemist." Now, while I am not the only one in the neighbourhood, and certainly claim no superiority over my brethren, I submit that the case was significant, and I believe when next year's Jury Papers go forth, they will exercise an influence in the same direction. Again: some of our friends will have it that Associates make bad Assistants; in justice to them, let me record a twenty years' experience as opposed to this. I have seen, on the contrary, that they command a higher rate of salary, and, as a rule, I have not found the educational mark a bar to general usefulness behind the counter. On another occasion you will perhaps permit me to say a word or two on the question of Masters and Apprentices. Meantime, I am, Sir, faithfully yours,

WM. FRED. SMITH.

12, *Keen's Row, Walworth, Nov.* 19, 1863.

DUTIES OF MASTERS AND APPRENTICES.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Dear Sir,—No doubt "Paterfamilias" has considerable cause of complaint against many druggists who take apprentices; but there is *another* side to the question. In the first place, parents generally seem to have a notion that the same acquirements that will make a good bacon-factor will make a good chemist, and they are offended if you hint that *any* knowledge which *their* son does *not* possess is necessary before you can accept him as an apprentice; assuming that *he* has been educated to that point where he is qualified to do anything in life that may "turn up." It is the commonest thing to hear men say, "I meant to put him to a grocer, but when I heard you wanted an apprentice, he seemed to like it, and so I thought if you would take him it would do as well."

You suggest, as one very simple thing, that a knowledge of Latin is necessary; and as one little test, you ask the father if *he* can read a prescription that happens to be upon the counter. At this he either goes off angrily, or suggests that his son will "*get used to it.*"

I am sorry to say too many apprentices are taken under the idea that they will "*get used to it.*"

If a parent apprentices a son with a knowledge that a particular acquirement is necessary to his success, and is fully aware that the son does not possess that acquirement, then the fault is as much the father's as the druggist's, and more so if the druggist has warned him of it. But I fully believe that the remarks of "Paterfamilias" do not apply to Pharmaceutical chemists at all (as a body).

Next we come to the apprentice himself. He may possess the rudimentary knowledge considered essential by the Pharmaceutical Society, but how very few follow it up by any further study at all! In numbers of cases coming under my own notice, apprentices have had every opportunity, and the masters (for their own sakes) have been anxious to assist them in every way, offered to furnish them with valuable books, chemicals (in moderation), and to accompany them at special times upon botanical excursions; but in no one instance have I known the master succeed in inducing the apprentice to apply even the smallest part of his time to the pursuits necessary to give him a good and sound knowledge of his future occupation: anything rather than study. The master finally leaves the apprentice to work his way by himself, or only gives him that knowledge which he can acquire during business hours under his own superintendence.

"Paterfamilias" may treat lightly the "art" of "making ointments," etc., but if he saw some of the "filthy messes" sent out even by some wholesale houses, he would not think a few months lost by an apprentice in acquiring the art of good pharmaceutical manipulation.

Parents often feel, no doubt, annoyed that their sons progress so slowly, but I say deliberately that in almost every case the fault lies either with the parents or the son.

I am, yours faithfully,

J. W. Gissing.

Wakefield, November 4th, 1863.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—In the last number of the Journal, Mr. C. J. Radermacher and "Paterfamilias" have ably advocated the duties of Masters and Apprentices; the former has done more than simply *advocate*, he has *practically* illustrated in his apprentice, Mr. Carteighe, what can be done by masters to promote their own, and the interest of those committed to their charge. I do not mean to say that every apprentice might by the judicious instruction of his master attain the same success that Mr. Carteighe has done; but I am fully persuaded, after nearly forty years' experience, that very much more might be done than is now accomplished, if masters would only be a little more considerate, and treat their apprentices as they would their own sons. "Paterfamilias" and other writers in the Journal, have from time to time adverted to the neglect which masters manifest for their apprentices, in failing to teach them, what they are morally and legally bound to do by their deed of apprenticeship. They *may* have all the domestic comforts in common with the rest of the family, and be treated so far with kindness; but this is not enough, the youths must not be worked to the utmost limit of their strength, as too many are from 7 or 8 A.M. to 10 or 11 P.M., without any arrangement for study or relaxation, and this too in some cases for *seven* days in the week. Surely it cannot under such circumstances be surprising if the apprentice at the termination of his servitude find himself disqualified for passing his Minor examination at the Pharmaceutical Society. I am fully aware that difficulties interpose in most establishments for any systematic arrangement, whereby the youth may have two or three hours daily for study and relaxation; but I have found a good deal may be done, if the master will only make the effort, and as I have found the following plan succeed after many years' experience, I am induced to suggest it for the adoption of others. At this season of the year, we open shop at 7.15, and after the ordinary routine of dusting, etc., breakfast at 8.15, and if not very busy and the weather favourable, give one of the young men some commission to execute in the town, or a letter to deliver, so that he may have an *object* in view,—thereby avoiding an evil which I have seen to arise, from sending a young man out without something to occupy his time. At dinner, an hour is allowed, so that if the meal occupy but half that time, the other is taken up by reading and attending to retail customers. At 7 P.M. all labour that can be postponed is done so till the following day, and the retail duties are taken alternately by the young men for an hour each. Of course these arrangements are liable to be interfered with, and the reserve is ready to give assistance if required, but notwithstanding these interruptions a good deal of time is afforded for reading, writing, etc., until 10 P.M. These opportunities, with such information as the master can give, are fully appreciated, and have resulted in every case most satisfactorily, as the records of the Pharmaceutical Society can testify.

I have abstained as much as I could from reiterating what has been so well said by others, on the necessity of keeping pace with the times, and have confined my observations rather to the *means* by which our apprentices may be enabled to do so. Let the masters *try*, and I have no fear of the result.

I am, Sir, yours respectfully,

M.P.S.

THE BRITISH PHARMACEUTICAL CONFERENCE.

MEETING AT BATH.

A meeting of the chemists of Bath was held at the room of Mr. Clark, 1, Argyle Street, on the evening of November 11th, 1863, to consider the subject of the British Pharmaceutical Conference formed at Newcastle-on-Tyne on the 2nd of September, 1863, as reported in the 'Pharmaceutical Journal' for October; the second meeting of which Conference is to be held in Bath, in the autumn of 1864.

There were present Messrs. Commans, Ekin, T. Harding, R. Harding, Jameson, Marsh, Nurthen, Tylee, Walker, and Pooley.

Mr. Tylee was requested to take the chair. Letters were read from several gentlemen, expressing regret at not being able to attend the meeting.

The Chairman opened the proceedings by reading extracts from the report of the meeting at Newcastle contained in the 'Pharmaceutical Journal,' explaining the constitution and rules of the Conference; when, after a brief consideration, it was proposed by Mr. Commans, seconded by Mr. P. Harding, and resolved, "That the gentlemen present do form themselves into a Local Association, to be called 'The Bath Branch of the British Pharmaceutical Conference,' to act as a Committee for the time being, to make such arrangements as may be necessary for the reception of the Conference, and to assist and correspond with the central Committee."

It was then proposed by Mr. Jameson, seconded by Mr. Marsh, and resolved, "That Mr. Tylee be requested to act as President of the Local Association."

It was proposed by Mr. Marsh, seconded by Mr. Jameson, and resolved, "That Mr. Pooley be requested to act as Secretary to the Local Association.

It was then suggested, as the first duty of the Association, to depute members to wait upon those Bath chemists who were not present, to solicit them to join the Local Association, and to allow their names, with the names of those present who were not already members, to be proposed as members of the Conference.

Messrs. Commans and Marsh were deputed to undertake the duty.

Twenty-three chemists have since joined the Local Association, and been nominated for election as members of the British Pharmaceutical Conference.

AMERICAN PHARMACEUTICAL ASSOCIATION.

At the last meeting of the above Association, the following resolutions relating to the British Pharmaceutical Conference were adopted:—

Whereas the mutual cultivation of science tends to break down sectional and national distinctions, and to unite all of kindred objects and pursuits in a common bond of friendship and goodwill; and whereas we have learned with satisfaction of the druggists and chemists of Great Britain having been summoned near the same time as our present meeting, and as we believe for purposes similar to our own; therefore,

Resolved, That we view this movement on the part of our brethren of the mother-country with feelings of satisfaction and encouragement, and invite their friendly co-operation and correspondence in advancing a knowledge of the science and art of Pharmacy, and in promoting the elevation of the profession to a position commensurate with the importance and dignity of its objects.

Resolved, That a copy of these Resolutions, signed by the proper officers of the Association, be transmitted to the President of said Conference of Druggists and Chemists of Great Britain by our Corresponding Secretary, who is also directed to solicit an exchange of their published Proceedings for those issued by this Association.

WOOD SPIRIT AND ITS DETECTION.

BY EMERSON J. REYNOLDS.

(*Read before the Royal Dublin Society.*)

The products of the destructive distillation of various vegetable matters, in addition to those of primitive organic origin, have received more than ordinary attention and careful

study at the hands of the chemist within the last ten or twelve years. Numerous highly complex acids, neutral substances, and bases, have rewarded the time and labour expended on their investigation, by the acquirement of both fame and riches for the discoverer—fame owing to the great scientific value of the results, and riches in consequence of their practical application. The number and complexity of the compounds formed during the destructive process cease to surprise us, when we consider the ever-changing circumstances under which they are produced. To take an instance intimately connected with the subject of the present paper; let us suppose a block of wood placed in a close cylinder, and submitted to a gradually increasing temperature. The essential constituents of this block are carbon, hydrogen, oxygen, and nitrogen, all in different states of combination both on the surface and in the interior of the mass. On the first application of heat, the strictly organic structures are broken up superficially, their elements entering into new combinations, in which state they are volatilized. On the still further increase of temperature, the next succeeding layers undergo a similar process; but now, owing to the alteration of temperature, and probably in consequence of the different proportions and arrangements of the proximate constituents, another set of affinities come into play: the result of this is, as might be anticipated, the production of many new compounds, materially different from those preceding them. Thus the process continues, the products altering in character as the temperature fluctuates. Such being the case, it ceases to be a matter of wonder that the compounds formed should be both numerous and variable, or that the examination of these should open an almost inexhaustible field of research to the scientific explorer.

My object in laying the present communication before the Society is to bring forward a new and reliable test for the detection of pyroxylic spirit, and likewise to give a brief preliminary notice of some experimental results which I have obtained in the course of an investigation undertaken with a view to the complete separation of the more volatile constituents of wood naphtha.

As pyroxylic spirit in its purest commercial form has been the subject of most of my experiments, it may be interesting to describe briefly the process by which it is manufactured on the large scale.

When wood is distilled in close vessels, and at high temperatures, it yields a variety of products, which may be classed under three heads—solid, liquid, and gaseous. The solid and gaseous products, not being connected with our present subject, may be dismissed without further comment, our attention being solely confined to the liquid portions. The tarry mixture which is the result of the first operation is rectified, and the more volatile portions redistilled from lime or chalk, by which means the acetic acid, which is present in large quantity in the crude liquor, is got rid of. The distillate then constitutes the rough wood-naphtha of commerce. When required for medicinal use, this is further purified as follows:—The crude material is largely diluted with water, by which means the oily hydrocarbons always present are precipitated, the last trace of these being afterwards removed by the action of oxidizing agents. The very weak methylic spirit thus produced is then frequently rectified *per se*, and finally over quick-lime until the specific gravity is reduced to about 800. It then constitutes medicinal naphtha.

The spirituous liquid thus produced is far from pure, since it consists of a mixture of acetate methyl, of acetone, methylic alcohol, and other bodies, which have been as yet but very imperfectly examined. Were we to attempt to separate these impurities by fractional distillation alone, failure could only attend our efforts, as a comparison of the boiling points of the three bodies already mentioned will show.

Acetate of methyl	boils at	133° F.
Acetone	,, ,,	133° F.
Methylic alcohol	,,	149° F.

The separation of methylic alcohol can be easily effected by means of chloride of calcium, but other methods must be adopted for the purpose of investigating the remaining constituents of the spirit.

When studying the deportment of various metallic salts with the purified naphtha, I observed the following reaction:—When a little solution of chloride of mercury was mixed with a few drops of the spirit, and then excess of potash added, the oxide of mercury first thrown down was speedily redissolved with the production of a clear solution. This result can be obtained in the cold, but is more rapidly brought about by the aid of a gentle heat. When acetic acid was added to the alkaline solution a yellowish-white

gelatinous precipitate was formed, but slightly soluble in dilute acetic, nitric, or sulphuric acids, though readily dissolved by hydrochloric, which appeared at the same time to decompose it. The deportment of this precipitate, on the application of heat, when taken in connection with other considerations hereafter to be mentioned, necessarily led me to conclude that I had obtained a definite compound of mercury with one of the constituents of pyroxylic spirit.

A considerable quantity of the naphtha was now submitted to careful distillation, and the portions which came over up to and at 176° F. were collected. After remaining steady at this temperature for some time, the boiling point rapidly rose to 182° F., and this distillate was likewise collected apart from the rest. On testing the two portions with chloride of mercury and potash, as before described, the first distillate gave the reaction very strongly, and the second not at all. The more volatile liquid was now rectified repeatedly from lime, and afterwards saturated with chloride of calcium. The impurities were then distilled off with the aid of a water-bath; and the liquid which collected in the receiver, when tested as before, exhibited the reaction remarkably well. The results of these experiments indicate, in the first instance, that pure methylic alcohol is not connected with the production of the mercurial compound; and, secondly, that the body whose presence is essential to the resolution of the oxide of mercury has a low boiling-point.

From this time I commenced the investigation of the mercurial compound, and have since succeeded in tracing it to its origin, and making out its history to some extent, as well as its more important chemical relations. As this is matter not essentially connected with the practical application of the test, I will reserve it for the subject of a future communication, merely stating here, that *acetone* is principally concerned in the production of the reaction already described.

I will now give the results of some experiments with the mercurial solution above referred to, which may serve to illustrate its more distinctive characters; I will then pass on to the description of a method for the detection of "methylated spirits."

Experiments with Mercurial Solution.—A portion of the liquid was evaporated *in vacuo;* after a few days, it had solidified to a firm, opaque jelly; after a little time longer, crystals commenced to sprout out from the edges, and continued increasing daily, until what was formerly a jelly had become covered with beautifully formed acicular crystals, many of the delicate reed-like tufts reaching far above the edges of the capsule, and growing, as it were, out of a resinoid amorphous mass. Analysis proved that these crystals consisted merely of chloride of potassium, the difference in crystalline form from that usually observed being due, as is well known, to the modifying influence of organic matter. The gummy residue remaining in the capsule after separating the crystals was then examined with a microscope, and found to be totally destitute of crystalline structure, the detached pieces being smooth and rounded, very brittle, and semi-transparent. When heated to a temperature of about 450° F., it swelled up considerably, at the same time evolving a quantity of mercurial and empyreumatic vapour, and leaving a voluminous residue of carbon. When the original solution was boiled violently, a white gelatinous precipitate was formed, readily soluble in dilute hydrochloric acid, though apparently but slightly acted on by dilute acetic, nitric, or sulphuric acids.

Excess of acetic acid was now added to another portion of the alkaline solution, and the resulting precipitate thoroughly washed, and then transferred to a retort; some hydrochloric acid was now added, and the mixture distilled. The distillate, when tested with chloride of mercury and potash in the usual manner, gave the reaction very strongly. Some solution of chloride of mercury and a few drops of the naphtha were mixed, and then excess of potash added, which caused the resolution of the oxide of mercury without the aid of heat. A portion of this solution, on the cautious addition of an acid, did not give any precipitate. The mixture was now gently warmed, and afterwards acetic acid added, upon which a precipitate was immediately formed.

From the results of these experiments, the following information may be gleaned:—1st. That the compound in question is somewhat resinoid in character, and destitute of crystalline structure; 2ndly. It is precipitated by boiling, or on the addition of an acid; 3rdly. It is easily decomposed by hydrochloric acid, the organic body passing off apparently unchanged; and 4thly. It is always necessary to employ heat previous to the addition of an acid, otherwise no precipitate will be produced immediately. A consideration of the first of these points, viz. the want of crystalline structure, the gelatinous appearance, and, in fact, the *colloidal* nature of the compound in question, led me to resort to the beau-

tiful principle of "dialysis," as a means of freeing its solution from all saline impurities. In order to put this idea to the test of experiment, some of the mercurial solution was placed on a dialyser, floating on a considerable bulk of distilled water. After twenty-four hours, the diffusate contained a large quantity of chlorine, and but a very small proportion of mercury. The diffusion was then allowed to continue for eight days, during which time the water was changed twice a day. On the ninth day a mere trace of chlorine could be detected in the diffusate, and but little mercury. The liquid on the dialyser was almost odourless and colourless, and of high specific gravity; it was neutral to test-papers, and gave a copious precipitate both on boiling and the addition of acetic acid, thus demonstrating that the original compound was still present in the solution, apparently unchanged.

In my subsequent experiments I have found this method of separation most valuable, since it enables me to easily purify the colloidal mercurial compound from the crystalloids which accompany it in solution. The recapitulation of these, my earliest experiments, is sufficient to show the more important relations of this peculiar compound, and likewise enables me to point out how this particular reaction may be made available for the detection of "methylated spirits."

DETECTION OF WOOD SPIRIT.—It is a well-known fact that the liquid sold under the name of "methylated spirits" is a mixture of ten per cent. wood-naphtha, and ninety of spirit of wine. The addition of the former communicates a very disagreeable taste and odour to the latter, thus rendering it unpotable, and, it is said, unfit for internal use. This mixed spirit, though easily recognized by its odour when alone, yet, if used in the preparation of many strong-smelling tinctures or essences, cannot be thus detected, and we are then obliged to resort to chemical means to aid us in the discovery of the adulteration. Up to the present time, but one test has been proposed for the detection of wood-spirit; this is generally known as "Ure's test," having been first mentioned by the eminent chemist of that name. This test simply consists in adding powdered hydrate of potash to the suspected liquid; if wood-spirit be present, the mixture becomes brown in about half an hour. That this is a simple, easy, and correct test when the spirit is unmixed with vegetable principles, I do not deny; but there is one serious source of error, which, I think, prevents it from being generally applicable to the detection of wood-spirit in alcoholic tinctures, and this I will now endeavour to make evident. In commencing the examination of a sample of any tincture, it is, of course, necessary to distil it, and apply the test to the distillate. We all know that most tinctures contain some volatile principles extracted from the plants used in their preparation; when these are distilled, the volatile oil, though generally of a high boiling-point, is dissolved in the vapour of the spirit, and thus contaminates even the first portions of the distillate. If to this we add caustic potash in powder, in many cases the liquid will assume a brown tint, even though wood-spirit is not present, owing to the well-known action of the alkali on many essential oils—thus indicating an adulteration which did not really exist.

The method which I adopt in testing for wood spirit is as follows:—A small quantity of the suspected spirit is placed in a tube retort, and distilled over into a cooled test-tube; two or three drops of a very dilute solution of chloride of mercury are now added to the distillate, and then excess of solution of caustic potash, and the whole well shaken. If the precipitated oxide of mercury does not redissolve even on warming the liquid, wood spirit is not present; should complete solution be effected, however, the mixture is warmed, and divided into two portions; to one acetic acid is added, which causes the formation of a yellowish-white bulky precipitate; the remaining portion is boiled, and a similar precipitate is thrown down, thus proving with certainty that wood naphtha is present. In applying this test, it is necessary to be careful not to add too much of the mercurial solution, as in that case an insoluble compound would be formed, and, as a consequence, a negative result arrived at.* When practised as I have now described, I look upon this test as being safe and reliable; at least, so far as my experience with it goes, I have always found its indications to be correct, and not liable to the ambiguity occasionally occurring with the potash test. I make this statement not on merely theoretical grounds, but from information gleaned in the course of a series of comparative experiments with pure tinctures, and those purposely adulterated with wood spirit. I

* It must not be forgotten that oxide of mercury is soluble to a slight extent in potash; but such a solution would not yield a precipitate on boiling, or on the addition of an acid.

trust that this reaction may prove useful as a means for the detection of an adulteration which, I am sorry to say, numerous analyses have shown me is practised to some extent in this city.*

IMPROVEMENTS IN GUN-COTTON.

(*Report by the Committee appointed to investigate some improvements in Gun-cotton. Read before the British Association. The Chemical portion by* DR. GLADSTONE.)

Since the invention of gun-cotton by Professor Schönbein, the thoughts of many have been directed to its application to warlike purposes. Many trials and experiments have been made, especially by the French; but such serious difficulties presented themselves that the idea seems abandoned in every country but one, Austria. From time to time accounts reached England of its partial adoption in the Austrian service, though no explanation was afforded of the mode in which the difficulties had been overcome, or the extent to which the attempts had been successful. The Committee, however, have been put in possession of the fullest information from two sources—Professor Abel, chemist to the War Department, and Baron W. von Lenk, Major-General in the Austrian Artillery, the inventor of the system. Professor Abel, by permission of the authorities, communicated to the Committee the information given by the Austrian Government to our Government, and also the results of his own elaborate experiments. General von Lenk, on the invitation of the Committee, by permission of the Austrian Government, paid a visit to this country, to give every information in his power on the subject, and brought over drawings and samples from the Imperial factory. The following is a summary of the more important points:—As to the chemical nature of the material, Von Lenk's gun-cotton differs from the gun-cotton generally made, in its complete conversion into a uniform chemical compound. It is well known to chemists that when cotton is treated with mixtures of strong nitric and sulphuric acids, compounds may be obtained varying considerably in composition, though they all contain elements of the nitric acid and are all explosive. The most complete combination (or product of substitution) is that described by Mr. Hadow as $C_{36}H_{21}(9NO_4)O_{30}$, which is identical with that termed by the Austrian chemists Trinitrocellulose, $C_{12}H_7(3NO_4)O_{10}$. This is of no use whatever for the making of collodion; but it is Von Lenk's gun-cotton, and he secures its production by several precautions, of which the most important are the cleansing and perfect desiccation of the cotton as a preliminary to its immersion in the acids,—the employment of the strongest acids attainable in commerce,—the steeping of the cotton in a fresh strong mixture of the acids after its first immersion and consequent imperfect conversion into gun-cotton,—the continuance of this steeping for forty-eight hours. Equally necessary is the thorough purification of the gun-cotton so produced from every trace of free acid. This is secured exclusively by its being washed in a stream of water for several weeks. These prolonged processes are absolutely necessary. It seems mainly from the want of these precautions that the French were not successful. From the evidence before the Committee it appears that this nitro compound, when thoroughly free from acid, is not liable to some of the objections which have been urged against that compound usually experimented upon as gun-cotton. It seems to have a marked advantage in stability over all other forms of gun-cotton that have been proposed. It has been kept unaltered for fifteen years; it does not become ignited till raised to a temperature of 136° C. (277° Fahr.); it is but slightly hygroscopic, and when exploded in a confined space, is almost entirely free from ash. There is one part of the process not yet alluded to, and the value of which is more open to doubt,—the treatment of the gun-cotton with a solution of silicate of potash, commonly called water-glass. Professor Abel and the Austrian chemists think lightly of it; but Von Lenk considers that the amount of silica set free on the cotton by the carbonic acid of the atmosphere is really of service in retarding the combustion. He adds, that some of the gun-cotton made at the Imperial factory has not been silicated at all, and some imperfectly; but when the process has been thoroughly performed, he finds that the gun-cotton has increased permanently about 3 per cent. in weight. Much apprehension has been felt about the effect of the gases produced by the

* I may mention that "cleaned spirit" is capable of reacting with the mercurial salt in a manner precisely similar to the ordinary "methylated spirit."

explosion of gun-cotton upon those exposed to its action. It has been stated that both nitrous fumes and prussic acid are among these gases, and that the one would corrode the gun and the other poison the artilleryman. Now, though it is true that from some kinds of gun-cotton, or by some methods of decomposition, one or both of these gases may be produced, the results of the explosion of the Austrian gun-cotton without access of air are found by Karolys to contain neither of them, but to consist of nitrogen, carbonic acid, carbonic oxide, water, and a little hydrogen and light carburetted hydrogen. These are comparatively innocuous; and it is distinctly in evidence that, practically, the gun is less injured by repeated charges of gun-cotton than of gunpowder, and that the men in casemates suffer less from its fumes. It seems a disadvantage of this material as compared with gunpowder that it explodes at a temperature of 277° Fahr.; but against the greater liability to accidents from this cause may be set the almost impossibility of explosion during the process of manufacture, since the gun-cotton is always immersed in liquid, except in the final drying.* Again, if it should be considered advisable at any time it may be stored in water, and only dried in small quantities as required for use. The fact that gun-cotton is not injured by damp like gunpowder is, indeed, one of its recommendations, while a still more important chemical advantage which it possesses arises from its being perfectly resolved into gases on explosion; so that there is no smoke to obscure the sight of the soldier who is firing or to point out his position to the enemy, and no residuum left in the gun, to be got rid of before another charge can be introduced.

Mr. J. SCOTT RUSSELL read the Report on the mechanical portion of this question, by which it appears that the greater effects are produced by gases generated from gun-cotton than by gases generated from gunpowder, and it was only after long and careful examination that the Committee were able to reconcile this fact with the low temperature at which the mechanical force is obtained. The great waste of force in gunpowder constitutes an important difference between it and gun-cotton, in which there is no waste. The waste in gunpowder is 68 per cent. of its own weight, and only 32 per cent. is useful. This 68 per cent. is not only waste in itself, but it wastes the power of the remaining 32 per cent. It wastes it mechanically, by using up a large portion of the mechanical force of the useful gases. The waste of gunpowder issues from the gun with much higher velocity than the projectile; and if it be remembered that in 100 lb. of useful gunpowder this is 68 lb., it will appear that 32 lb. of useful gunpowder gas is wasted in impelling a 68-lb. shot composed of the refuse of gunpowder itself. There is yet another peculiar feature of gun-cotton. It can be exploded in any quantity instantaneously. This was once considered its great fault; but it was only a fault when we were ignorant of the means to make that velocity anything we pleased. General von Lenk has discovered the means of giving gun-cotton any velocity of explosion that is required by merely the mechanical arrangements under which it is used. Gun-cotton in his hands has any speed of explosion, from 1 foot per second to one foot in $\frac{1}{1000}$ of a second, or to instantaneity. This instantaneous explosion of a large quantity of gun-cotton is made use of when it is required to produce destructive effects on the surrounding material. The slow combustion is made use of when it is required to produce manageable power, as in the case of gunnery. It is plain, therefore, that if we can explode a large mass instantaneously we get out of the gases so exploded the greatest possible power, because all the gas is generated before motion commences, and this is the condition of maximum effect. It is found that the condition necessary to produce instantaneous and complete explosion is the absolute perfection of closeness of the chamber containing the gun-cotton. The reason of it is, that the first ignited gases must penetrate the whole mass of the cotton, and this they do, and create complete ignition throughout, only under pressure. This pressure need not be great. For example, a barrel of gun-cotton will produce little effect and very slow combustion when out of the barrel, but instantaneous and powerful explosion when shut up within it. On the other hand, if we desire gun-cotton to produce mechanical work, and not destruction of materials, we must provide for its slower combustion. It must

* In ten years' experience it is proved that this temperature is sufficiently high to ensure safety of manipulation; 277° Fahr. is an artificial temperature, and artificial temperatures accidentally produced are generally high enough to ignite gunpowder. The greater liability to accident from this cause can therefore, scarcely be admitted.

be distributed and opened out mechanically, so as to occupy a larger space, and in this state it can be made to act even more slowly than gunpowder; and the exact limit for purposes of artillery General von Lenk has found by critical experiments. In general, it is found that the proportion of 11 lb. of gun-cotton, occupying 1 cubic foot of space, produces a greater force than gunpowder, of which from 50 to 60 lb. occupies the same space, and a force of the nature required for ordinary artillery. But each gun and each kind of projectile requires a certain density of cartridge. Practically, gun-cotton is most effective in guns when used as $\frac{1}{4}$ to $\frac{1}{3}$ weight of powder, and occupying a space of $1\frac{1}{10}$th of the length of the powder-cartridge. The mechanical structure of the cartridge is of importance as affecting its ignition. The cartridge is formed of a mechanical arrangement of spun cords, and the distribution of these, the place and manner of ignition, the form and proportion of the cartridge, all affect the time of complete ignition. It is by the complete mastery he has gained over all these minute points that General von Lenk is enabled to give to the action of gun-cotton on the projectile any law of force he pleases. Its cost of production is considerably less than that of gunpowder, the price of quantities which will produce equal effects being compared. Gun-cotton is used for artillery in the form of a gun-cotton thread or spun yarn. In this simple form it will conduct combustion slowly in the open air, at a rate of not more than 1 foot per second. This thread is woven into a texture or circular web. These webs are made of various diameters, and it is out of these webs that common rifle cartridges are made, merely by cutting them into the proper lengths, and enclosing them in stiff cylinders of pasteboard, which form the cartridges. (In this shape its combustion in the open air takes place at a speed of 10 feet per second.) In these cylindrical webs it is also used to fill explosive shells, as it can be conveniently employed in this shape to pass in through the neck of the shell. Gun-cotton thread is spun into ropes in the usual way, up to 2 inches diameter, hollow in the centre. This is the form used for blasting and mining purposes; it combines great density with speedy explosion. The gun-cotton yarn is used directly to form cartridges for large guns by being wound round a bobbin so as to form a spindle like that used in spinning mills. The bobbin is a hollow tube of paper or wood; the object of the wooden rod is to secure in all cases the necessary length of chamber in the gun required for the most effective explosion. The gun-cotton circular web is enclosed in close tubes of india-rubber cloth to form a match line, in which form it is most convenient, and travels with speed and certainty. In large quantities, for the explosion of mines, it is used in the form of rope, and in this form it is conveniently coiled in casks and stowed in boxes. As regards conveyance and storage of gun-cotton: it results from the foregoing facts, that 1 lb. of gun-cotton produces an effect exceeding 3 lb. of gunpowder in artillery. This is a material advantage, whether it be carried by men, by horses, or in waggons. It may be placed in store, and preserved with great safety. The danger from explosion does not arise until it is confined. It may become damp and even perfectly wet without injury, and may be dried by mere exposure to the air. This is of great value in ships of war, and in case of danger from fire, the magazine may be submerged without injury. As regards its practical use in artillery, it is easy to gather from the foregoing general facts how gun-cotton keeps the gun clean and requires less windage, and therefore performs much better in continuous firing. In gunpowder there is 68 per cent. of refuse, or the matter of fouling. In gun-cotton there is no residuum, and therefore no fouling. Experiments made by the Austrian Committee proved that 100 rounds could be fired with gun-cotton, against 30 rounds of gunpowder. From the low temperature produced by gun-cotton the gun does not heat. Experiments showed that 100 rounds were fired with a 6-pounder in 34 minutes, and the gun was raised by gun-cotton to only 122° Fahrenheit, whilst 100 rounds with gunpowder took 100 minutes, and raised the temperature to such a degree that water was instantly evaporated. The firing with the gunpowder was therefore discontinued; but the rapid firing with the gun-cotton was continued up to 180 rounds without any inconvenience. The absence of fouling allows all the mechanism of a gun to have much more exactness than where allowance is made for fouling. The absence of smoke promotes rapid firing and exact aim. There are no poisonous gases, and the men suffer less inconvenience from firing in casemates, under hatches, or in closed chambers. The fact of smaller recoil from a gun charged with gun-cotton is established by direct experiment: its value is $\frac{2}{3}$ of the recoil from gunpowder, projectile effect being equal. To understand this may not be easy. The waste of the solids of gunpowder accounts for one part of the saving, as in 100 lb. of gunpowder 68

lb. have to be projected in addition to the shot, and at a much higher speed. The remainder, General von Lenk attributes to the different law of combustion. But the fact is established. The comparative advantages of gun-cotton and gunpowder for producing high velocities, are shown in the following experiment with a Krupp's cast-steel gun, 6-pounder. With ordinary charge 30 oz. of powder produced 1338 ft. per second. With charge of 13½ oz., gun-cotton produced 1563 ft. The comparative advantages in shortness of gun are shown in the following experiments, 12-pounder:—

	Calibres.	Charge.	Velocity: feet per second.
Cotton, length	10	15·9 oz.	1426
Powder, "	13½	49 (normal powder charge)	1400
Cotton, "	9	17	1402

As to advantage in weight of gun, the fact of the recoil being less in the ratio of 2:3 enables a less weight of gun to be employed, as well as a shorter gun, without the disadvantage to practice arising from lightness of gun. As regards durance of gun, bronze and cast-iron guns have been fired 1000 rounds without in the least affecting the endurance of the gun. As regards its practical application to destructive explosions of shells, it appears that from a difference in the law of expansion, arising probably from the pressure of water in intensely-heated steam, there is an extraordinary difference of result, namely, that the same shell is exploded by the same volume of gas into more than double the number of pieces. This is to be accounted for by the greater velocity of explosion when the gun-cotton is confined very closely in very small spaces. It is also a peculiarity that the stronger the shell, the smaller the fragments into which it is broken. As regards mining uses, the fact that the action of gun-cotton is violent and rapid in exact proportion to the resistance it encounters, tells us the secret of its far higher efficacy in mining than gunpowder. The stronger the rock, the less gun-cotton, comparatively with gunpowder, is necessary for the effect; so much so that while gun-cotton is stronger than powder as 3 to 1 in artillery, it is stronger in the proportion of 6·274 to 1 in a strong and solid rock, weight for weight. It is the hollow-rope form which is used for blasting. Its power of splitting up the material is regulated exactly as wished. As regards military and submarine explosion, it is a well-known fact, that a bag of gunpowder nailed on the gates of a city will blow them open. In this case gun-cotton would fail. A bag of gun-cotton exploded in the same way is powerless. If one ounce of gunpowder is exploded in scales, the balance is thrown down; with an equal force of gun-cotton nothing happens. To blow up the gates of a city a very few pounds of gun-cotton, carried in the hand of a single man, will be sufficient,—only he must know its nature. In a bag it is harmless; exploded in a box it will shatter the gates to atoms. Against the palisades of a fortification: a small square box containing 25 lb., merely flung down close to it, will open a passage for troops; in actual experience on palisades a foot diameter and 8 feet high, piled in the ground, backed by a second row of 8 inches diameter, a box of 25 lb. cut a clean opening 9 feet wide. To this three times the weight of gunpowder produced no effect whatever, except to blacken the piles. Against bridges: a strong bridge of oak, 24 feet span, was shattered to atoms by a small box of 25 lb. laid on its centre; the bridge was not broken, it was shivered. As to its effects under water: in the case of two tiers of piles, in water 13 feet deep, 10 inches apart, with stones between them, a barrel of 100 lb. gun-cotton, placed 3 feet from the face and 8 feet under water, made a clean sweep through a radius of 15 feet, and raised the water 200 feet. In Venice, a barrel of 400 lb. placed near a sloop in 10 feet water, at 18 feet distance, threw it in atoms to a height of 400 feet. All experiments made by the Austrian Artillery Committee were conducted on a grand scale,—36 batteries, six and twelve pounders (gun-cotton) having been constructed, and practised with that material. The reports of the Austrian Commissioners are all based on trials with ordnance, from six pounders to forty-eight pounders, smooth bore and rifled cannon. The trials with small fire-arms have been comparatively few, and are not reported on. The trials for blasting and mining purposes were also made on a large scale by the Imperial Engineers' Committee, and several reports have been printed on the subject.

ON THE COLOURING PRINCIPLE OF VOLATILE OILS AND A NEW BODY, AZULENE.

BY SEPTIMUS PIESSE, F.C.S.

It is generally known that essential oils or ottoes of plants have peculiar and characteristic colours, they are either yellow, blue, green, brown, or white, *i. e.* colourless.

Having made some progress towards the discovery of the nature of the matters which impart these several colours, I now record the facts ascertained.

The principal interest rests with the blue substance which gives colour to the otto of chamomile, because this same body is present in other volatile oils and imparts to them a green colour, being at the time under disguise by a yellow resin, which is also present in volatile oils of a green tint.

When blue otto of chamomile is subjected to fractional distillation, the white hydrocarbon anthemidine is easily separated from the blue colouring, because the latter requires a much higher temperature to vaporize it than the former.

By the fractional distillation of otto of wormwood, Absinthii, I obtain first a nearly colourless hydrocarbon, then at the third fractioning an oil having a brilliant green colour, which at the fifth fractioning divides into a blue oil and a residuary yellow resin.

When otto of Patchouly, obtained by distilling with water the Indian herb *Pogostemon Patchouly*, is subjected to fractional distillation, I obtain in like manner, first a colourless hydrocarbon, then, but not till the eleventh fractioning, a beautiful blue oil and a brown-yellow residue; the great number of fractionings required to separate the blue oil in this case is caused by the closer boiling-points between the patchouly hydrocarbon, the blue oil, and the resin, all of which are exceedingly high. The otto of bergamot from the rind of the fruit, *Citrus bergamia*, as also otto of Ceylon Lemon-grass, *Andropogon Schœnanthus*, yield by the same treatment small portions of this blue colouring. By repeated rectification of the blue fluid, from whatever source derived, I at length render it free from extraneous matter and in a state of purity, it then has a fixed boiling-point of 576° Fahr., its sp. gr. 0·910; when boiled, it produces a dense vapour of a blue colour, having special optical* characters. I have named this substance Azulene, from azure—blue. The analysis of Azulene shows its formula to be :—

C 16	82·05	81·21
H 13	11·12	10·95
O	6·83	7·84
	100·00	100·00

Or, $C_{16}H_{12}+HO$.

The yellow colouring-matter which imparts its tint to the several ottoes, appears to be an oxidized portion of the otto so stained. In nearly all instances,

* Sir David Brewester has optically examined two blue ottoes which owe their colour to the presence of azulene, namely *Matricaria Chamomilla* and *Achillea Millefolium*. "Without entering," says Sir David, "into details respecting the general action of these oils upon the different-coloured portions of the spectrum, I shall confine myself to a slight notice of their specific action in which they differ from all the various bodies which I have yet examined.

"Between the two lines A and B, of Fraunhofer's map of the spectrum, there are two groups of lines shown in that map. The two oils absorb the light in these portions more powerfully than in the portions adjacent to them. No other fluid or solid on which I have made experiments acts in a a similar manner; but what is very remarkable, the earth's atmosphere exercises a similar action when the sunlight passes through its greatest thickness at sunrise and sunset."

ottoes which are colourless when first obtained from their source become yellow by age, *i. e.* oxidation. This however, is not universal, as the otto of nutmeg remains colourless for a lengthened period, even when air is drawn through it by an aspirator.

The oxidized portion of the yellow-coloured oils, when separated from the pure otto in which it is dissolved, are true resins; the majority of ottoes oxidize during the act of distillation, hence from this cause they vary in colour from pale-yellow to red-brown. When new, that is, freshly distilled, several essential oils are of a pale-green, but indicating the presence of azulene; but as oxidation proceeds, the yellow resin generated conceals the azulene. We have—

A. Ottoes which are colourless, containing neither azulene nor resin.

B. Ottoes which are yellow, containing resin only.

C. Ottoes which are blue, containing azulene only.

D. Ottoes which are brown-green and yellow-green, containing azulene and resin together, in proportions varying as optically indicated.

It is remarkable how little azulene gives colour to an oil that contains no yellow resin: the otto of chamomile is familiarized to us by its blue colour, but it does not contain one per cent. of azulene; Patchouly otto, which yields six per cent., and wormwood otto which gives three per cent. of azulene, do not appear at all blue, owing to the presence of an excessive quantity of yellow resin.

At the third fractioning of wormwood, the yellow resin and the azulene are in due proportions to form a green solution, and such is probably the case with other ottoes known for their green colour, such as Caguput, but which I have not yet examined.

Of the chemistry of azulene, and the part it plays in connection with odorous bodies, I hope soon to eliminate some fresh facts and to place them before the reader.

ON THE EXTRACTION OF THALLIUM ON A LARGE SCALE FROM THE FLUE-DUST OF PYRITE BURNERS.

BY MR. W. CROOKES.

All the processes for the extraction of thallium hitherto published by myself and others have been applicable to but small quantities of the material from which the metal is obtained. They have, in most cases, directed the employment of distilled water and porcelain basins, and have involved the passing of sulphuretted hydrogen through filtrates,—a method of proceeding altogether out of the question when large quantities of material are to be dealt with. Having for many months past been occupied, in conjunction with Messrs. Hopkin and Williams, the manufacturing chemists, of Wandsworth, on the extraction of the metal from an amount of material far greater than has ever been treated before, I have received from various quarters some hundreds of specimens of deposit, flue-dust, and minerals, every one of which was first of all carefully tested for thallium by means of the spectroscope. The practical employment of spectrum analysis is, I regret to say, of but very limited use, and has caused me many disappointments before I finally determined to abandon it, except by way of confirmation in subsequent experiments. The spectrum by itself gives no indication of quantity. The green line produced by the residue containing but one part of thallium in a thousand is as vivid and distinct as the line given by the pure metal, and therefore before I could decide whether a deposit contained sufficient thallium to repay for its extraction, it was necessary to make an estimation in the moist way by exhausting a weighed quantity of the dust with water, and adding hydrochloric acid to the solution. Associated with thallium in these deposits is, unfortunately, a variety of other metals, which render the separation of the thallium in a pure state a rather difficult matter. Amongst these metals I have found mercury, copper, arsenic, antimony, iron, zinc, cadmium, lime, and selenium. The flue-dust upon which we have at present been ope-

rating amounts to about five tons, the whole of which has been treated by the method I am about to describe. The process I now adopt is as follows:—The thalliferous dust is first treated in wooden tubs with an equal weight of boiling water, and is well stirred; during this operation a considerable quantity of nitrous acid is evolved; after which the mixture is allowed to rest for four-and-twenty hours for the undissolved residue to deposit. The liquid is then siphoned off, the residue is washed, and afterwards treated with a fresh quantity of boiling water. The collected liquors, which have been siphoned off from the deposit, are allowed to cool, and are precipitated by the addition of a considerable excess of strong hydrochloric acid; and the precipitate, consisting of very impure chloride of thallium, is allowed to subside. The chloride obtained in this way is then well washed on a calico filter, and afterwards squeezed dry. I may mention that from three tons of the dust I obtained 68 lbs. of this rough chloride. The next step in the process with this large quantity is necessarily a tedious one. It consists in treating the crude chloride in a platinum dish with an equal weight of strong sulphuric acid, and afterwards heating the mixture to expel the whole of the hydrochloric acid. To make sure of this, the heat must be continued until the greater part of the excess of sulphuric acid is volatilized. After this the mass of sulphate of thallium is dissolved in about twenty times its weight of water, and the solution filtered. On the addition of hydrochloric acid to this solution, nearly pure chloride of thallium is thrown down; this is collected on a filter, well washed, and then squeezed dry. The object of the process so far has been to obtain a tolerably pure chloride; but as thallium is most easily reduced to the metallic state from the sulphate, it is now necessary again to convert the chloride into sulphate. For this purpose I add the dry chloride gradually to hot sulphuric acid, using four parts by weight of strong acid to six parts of the chloride. The mixture so obtained is heated strongly until all the hydrochloric acid is expelled, and the residue assumes the form of a dense liquid. This being set aside, gradually solidifies to a white crystalline mass. When this is dissolved in water an immense amount of heat is evolved, and great care must be taken to avoid breakage of the vessels. The best way of dissolving it is to add it slowly to ten times its weight of hot water. A solution is thus obtained, which must be filtered, and on being concentrated and set aside to cool, crystals of sulphate of thallium will be obtained, which may be rendered quite pure by re-crystallization. The final step in the process is the reduction of the metal from this sulphate. Many ways can be adopted for the reduction when only a few ounces are under experiment; but when the quantity of crystallized salt is from a quarter to half a hundredweight, a process must be devised which will admit of considerable quantities being reduced without too much expenditure of time or trouble. Experiments in the dry way were not very successful. No difficulty was experienced in partially reducing the metal by igniting the sulphate with black flux, or with cyanide of potassium, in a clay crucible; but I could not remove all the sulphur in this way. When sulphate of thallium is projected into a crucible containing fused cyanide of potassium, there is an immediate reduction to the state of protosulphide, which forms a brittle, metallic-looking mass, of the lustre of plumbago, and fusing more readily than the metal. A few cells of Groves's batteries offer a most ready means of reducing the sulphate, and in quantities less than half a pound nothing can be simpler than this process. The fusion of the metal is readily effected. An iron crucible is placed over a gas-burner, and a tube is arranged so that a constant stream of coal-gas may flow into the upper part of the crucible. Lumps of the compressed sponge are then introduced, one after the other as they melt, until the crucible is full of metal. It is then stirred up with an iron rod, and the thallium may either be poured into water and obtained in a granulated form, or cast into an ingot. Thirty or forty fusions have been performed in the same crucible without the iron being acted upon in the least by the melted thallium. It contracts strongly on cooling. The coating of tarnish which it acquires while hot is instantly removed by water, which renders the surface perfectly bright. The liquid metal in the crucible, when protected by the stream of coal-gas, can scarcely be distinguished from mercury. Thallium is not absolutely identical in colour with any other metal, but approaches nearest to cadmium and tin. It has perfect metallic lustre. Its specific gravity is 11·9. It is very malleable, but not very ductile. It can only be drawn into wire with great difficulty, but by the operation technically known as squirting, thallium wire may be formed most readily. Thallium is very soft, being only exceeded in this property by the alkali metals. A point of lead will scratch thallium with the

greatest readiness. Thallium possesses the property, in common with most soft metals, of welding by pressure in the cold. Rubbed on paper, it gives a dark streak, having a yellow reflection, which in a short time nearly fades out, but may be restored with an alkaline sulphide. Thallium is strongly diamagnetic, being in this respect nearly, if not quite equal to bismuth. It melts at 550° Fahrenheit, and distils at a red heat, evolving brown vapours into the air at a little above its melting-point. When a minute fragment of thallium, or of any of its salts, is introduced into the flame of a spirit-lamp, it colours it of a most intense green, which, when examined by means of a spectrum apparatus, appears to be absolutely monochromatic, communicating one single green line to the spectrum. This property of the metal is now too well known to require further remarks. From it the name thallium was chosen, from *thallos*, a green bud. A magnificent green fire for pyrotechnic purposes can be made with chlorate of thallium 8 parts, calomel 2 parts, resin 1 part. The chlorate of thallium is a beautiful crystalline, difficultly soluble salt, which may be prepared by dissolving the metal in chloric acid, or by mixing together saturated aqueous solutions of chlorate of potash and nitrate of thallium. It is anhydrous. At the present price of thallium its employment for pyrotechnic purposes would be out of the question; but a very little reduction in price would enable its magnificent green flame to be employed for ship-signals, for which purpose the extraordinary intensity and monochromatic character of the light would enable it to penetrate a hazy atmosphere without the change of colour suffered by the ordinary green lights in which baryta is used. The atomic weight of thallium is 203. This result, however, is not deduced from sufficiently accurate analysis to render it entirely trustworthy, and I am now engaged in determining the equivalent in a more accurate manner. The physiological action of thallium is a matter of some doubt. Some French chemists have said that it produces lowness of spirits, and causes loss of hair. I cannot say that it has produced either of these effects upon me, although I have been much exposed to the action of its fumes during the last few months, and have occasionally swallowed a few grains of its salts. The only effect which I have noticed, besides the staining of the hair and nails, is a corrosive action which the sulphate has on the skin, burning the hands, and rendering the epidermis yellow and horny. In this respect it acts like mercury salts. Several thallium salts are sensitive to light: the protochloride and double phosphate of thallium and ammonia are especially so.—(*Read before the British Association.*)

"NOTE ON FORMOSA CAMPHOR."

BY ROBERT SWINHOE, F.G.S., ETC., H.M. CONSUL AT TAIWAN.

The manufacture of this article has for some years been monopolized by the Taotai (or head Mandarin) of the island, and its sale farmed out to wealthy natives. In former years, a good deal of the drug was clandestinely produced, and smuggled across to China, where it was largely bought up by foreign speculators, and carried to Hongkong for shipment to Calcutta, at which place it finds the readiest market, being used by the natives of Hindostan for lubricating the body and other domestic purposes. But now its monopoly is so closely watched that almost the entire trade in it falls to the lucky individual whose Chinese agents can secure the monopoly. This bad system has occasioned the price of the article in Hongkong to increase considerably in value, and to make the profits accruing to the fortunate monopolist almost fabulous. The cost of the drug, I learn, amounts to only 6 dollars at its place of manufacture. The monopolist buys it from the Mandarin at 16 dollars the pecul, and sells it in Hongkong at 28 dollars. The gigantic laurel (*Laurus Camphora*) that yields the camphor, covers the whole line of high mountains extending north and south throughout Formosa. But as the greater part of this range is in the hands of the aborigines, the Chinese are able to gain access only to those parts of the mountains contiguous to their own territories that are possessed by the more docile tribes. The trees, as they are required, are selected for the abundance of their sap, as many are too dry to repay the labour and trouble of the undertaking. A present is then made to the chief of the tribe to gain permission to cut down the selected trees. The best part of the tree is secured for timber, and the refuse cut up into chips. The chips are boiled in iron pots, one inverted on another, and the sublimated vapour is the desired result. The camphor is then conveyed down in carts of

rude construction, and stowed in large vats, with escape-holes at the bottom, whence exudes an oil, known as *camphor-oil*, and used by Chinese practitioners for its medicinal properties in rheumatic diseases. Samples of this oil have been sent home, and it may eventually become a desideratum in Europe. From the vats the camphor is stowed in bags to contain about a pecul each, and is thus exported. The Chinese Government has empowered the Formosan authorities to claim on its account all the timber produced by the island for ship-building purposes; and it is on this plea the Taotai appropriates the prescriptive right of dealing in camphor. About 6000 peculs of the drug are annually produced in the neighbourhood of Tamsuy.—*Extracted from Paper read before the British Association at Newcastle.*

MISCELLANEA.

The late Poisonings by Prussic Acid and Tincture of Aconite.—The following are the principal facts of this terrible case. On Saturday evening, November 7, Charles Gould, a cabman, when on his stand at Camberwell Green, was hailed by a woman and two little girls, and he was told to drive them to the Great Eastern Railway Station. He had not proceeded far when he was stopped by a man, who said he knew the lady and wished to go with her. He accordingly got into the cab. When they arrived at Nortonfolgate, he was directed to pull up at the shop of Mr. Cyrus Fane, chemist, when the woman got out and asked for a draught for a gentleman who had taken too much drink. She was supplied with a mixture composed of bicarbonate of potash, sal volatile, and compound tincture of cardamoms, with cinnamon water. She also purchased a medicine glass in a case. The cabman then drove them to the railway station.

On the same evening, about twenty minutes past eight, James Parker, a cabman who was on the stand at the Great Eastern Station, was called by a man who had with him a woman and two little girls, and requested to drive them to the Royal Oak, Westbourne Grove, by way of the City. When he had driven as far as the Green Dragon, Bishopsgate Street, he was directed by the man to procure a pint of half-and-half. This he did, and shortly afterwards the man put the pint-pot out of the cab-window, and the driver took it back to the public-house. They then continued their journey as far as Furnival's Inn, when the man pulled him up, and getting out, shut the door before the cab stopped. The man then paid the fare, told the driver to take the others to the Royal Oak, and then walked away. On his arrival at the Royal Oak, the cabman found the youngest child lying on the front seat, and the mother, with the eldest, at the bottom of the cab. The bodies were then taken to St. Mary's Hospital, where they were examined by Mr. Coombes, one of the house surgeons, who, from a *post-mortem* examination he had made, had no doubt they had died from prussic acid.

In consequence of the published description of the man who accompanied the woman and two children as given by the cabmen, the suspicions of a letter-carrier, Prescott, were aroused as to a person named Hunt, residing at Camberwell, and he communicated with the police, who, on Monday night, November 9th, arrested Hunt at his own house. From the evidence of Inspector Meloy, it would appear that immediately before the arrival of the police, Hunt had swallowed poison, for he began to vomit violently, and the retching continued for about an hour after he reached the police-station, when he died. Before his death, he acknowledged that he might have taken tincture of aconite; he requested to have writing materials, and began a letter to the effect that his employers, Messrs. Butler and M'Culloch,* owed him £120, which he wished to be given to his children if living. Dr. Puckle stated that he administered emetics of sulphate of zinc; he also used the stomach-pump. A bottle found in Hunt's room, which contained a few drops of liquid, Dr. Puckle examined, and found it to give the characteristic effects of aconite. He had made a *post-mortem* examination of the body, and, on analysing the contents of the stomach and applying the physiological test, the presence of aconitine was conjectured. The chemical tests applied were bichromate of potash, and sulphuric acid, which gave the characteristic reactions of aconitine. It was proved, by the shopman of Messrs. Butler and M'Culloch, that Hunt had, on the Monday, obtained both tincture of aconite

* Messrs. Butler and M'Culloch have given an unqualified denial to the truth of this statement of Hunt.

and essential oil of almonds, professedly for a customer. The articles were placed on the counter to be called for, and were supposed to have been taken away by Hunt. The jury returned a verdict of *felo de se*, by a majority of twelve to three. The body was accordingly buried at night, without any burial service.

The inquest on the bodies of the woman and two children, held at the hospital before Dr. Lankester, was adjourned to Monday, November 16th, when the joint reports of Drs. Randall and Matthiessen were read. The matters subjected to analysis were contained in four jars, and consisted of the contents of all three stomachs, and certain other portions of the bodies, in all of which prussic acid was detected; from the small quantity of potash found in the contents of the stomachs on incineration, it appeared clear that cyanide of potassium had not been used. With reference to the question as to whether the prussic acid was given with the porter, two drachms of prussic acid of the pharmacopœia strength were added to a pint of porter, and it was found that its presence could not be detected either by the taste or smell. The jury returned the following verdict—"That Mary Ann Hunt was found dead in a cab on Saturday night, from the effects of prussic acid, and that the prussic acid was administered to her maliciously and with intent to take away her life, by Samuel William Hunt." The same verdict was returned in the case of the two children.

Accidental Poisoning by Essential Oil of Almonds.—An inquest has been held by Mr. William Carter, the coroner for East Surrey, at Lambeth Workhouse, on the body of Sarah Taylor, aged 60, a cook in the service of a Mrs. Carlin, of Grove Place, Brixton. From the evidence given by the coachman (Joseph Hines), it appeared that while removing some bottles out of the cupboard of the old house to the new one, the cook brought one bottle to him, and said, "What is this in this bottle?" He looked at the bottle, upon which was pasted a large written label, "Essential Oil of Bitter Almonds—Poison." He left her, and went upstairs to assist a woman taking down some curtains, and upon his returning downstairs he found the cook leaning over the sink and vomiting. He called for assistance, and supported her in his arms, and then laid her on the floor. He at once sent for medical advice. Three medical men arrived at the same time, and after attending three or four hours, during which time she was insensible, they had her removed to the infirmary of the Lambeth Workhouse, where she was attended by Mr. Bullen, the medical officer, who did all that was possible for her, but she died in fifteen hours after her reception into the workhouse.

Miss Carlin stated that on the day in question, in clearing the bottles out of a cupboard, there was found another cupboard behind, in which was a pint bottle containing the essential oil of almonds,* used for flavouring pastry; and judging from the quantity deficient in the bottle, she thought the deceased must have drank about half a cupful of the essence. Her opinion was that the deceased had no intention of committing suicide, but that having tasted it, and finding it pleasant, had swallowed enough to destroy life.

The jury returned a verdict of "Accidental death, from taking essential oil of bitter almonds without any intention of destroying life."

Death from Phosphorus.—On Wednesday, November 18th, an inquest was held by Dr. Lancaster, at the Bank of England Tavern, Cambridge Place, Paddington, relative to the death of John Rogerson, aged 15. The deceased, it appeared, was errand-boy to a fishmonger, and on Wednesday afternoon last as he and another boy named Bernard were passing through Porchester Square, opposite Mr. Ashford's, the chemist's, they saw some yellow stuff lying in the gutter: it looked like sugar-candy. The boy Bernard picked it up, and found it smelt like lucifers. The deceased said it was sulphur, and that he would have it. Bernard gave deceased a piece of paper, in which he wrapped the substance. He then put it into his pocket, and went into his master's shop. Soon afterwards deceased went out again with the basket, and when in Westbourne Place he cried out, "I am on fire." A crossing-sweeper, hearing his cries and seeing his clothes smoking, ran to him, and he and another man succeeded in putting out the fire. In doing so, however, something flew about, a portion of which fell on the sweeper's finger and blistered it. The basket was also burnt in several places. The deceased

* Probably *essence* of almonds, as it is not likely that so large a quantity of the essential oil would be kept in a private house.

was then removed in a cab to the hospital, where Mr. J. N. Moore, one of the house-surgeons, attended to him. That gentleman stated that the boy's clothing smoked then, and there was a strong smell of prussic acid. On removing the burnt clothes, he found that the lower part of the abdomen was much burnt, as also the upper part of the left thigh. The boy died on Sunday last from the shock produced by the injuries. Mr. Moore made several suggestions as to what the combustible matter was. *He thought it was one of the explosive balls composed of phosphoric acid, and which were sold by chemists to kill rats!* The boy told him that while he had the stuff in his pocket he rubbed it with his finger, when it exploded. The coroner said it was perfectly clear what the stuff was—it was phosphorus. If phosphorus were allowed to lie in water it would not take fire, but if removed it would, particularly if submitted to friction. The evidence adduced by the witnesses showed plainly the properties possessed by phosphorus, and no doubt that which had caused this death had been accidentally dropped. A verdict of "Accidental death, through the combustion of phosphorus," was then recorded.—*Times.*

Alleged Poisoning by Coloured Sweetmeats.—An inquest has been held before Mr. Bedford, coroner for Westminster, on the body of Arthur Leopold Bosworth, aged 5 years, who is supposed to have died from eating a sweetmeat called a "red-lady." At the adjourned inquest Dr. Harley stated that he had tested the coloured sweetmeats, which he found contained no poison. On examining the so-called black cake however, and submitting a portion of it to the sulphuric-acid test, it threw off metallic copper; and on the solution being submitted to the galvanic test, it yielded positive copper. The other portion of the black cake contained grains of copper, visible to the naked eye. The manufacturer of the cakes said they were composed of rhubarb, Seville orange-peel, and treacle, and they were called black-currant squares! It appeared that these precious compounds were boiled in copper pans. Dr. Harley said the proof they required was absent, for the stomach was quite empty. The symptoms however were those of copper poisoning. The jury returned a verdict of "Death from convulsions; but whether those convulsions were produced by poison or by natural causes, there was not sufficient evidence to prove."

CAUTION TO CHEMISTS.

We are requested by Mr. Pollock, of Fenchurch Street, to give publicity to the following circumstance, as a caution to his brother Pharmaceutists:—

"On the 30th of October, about six o'clock in the evening, while in my shop serving a well-known customer for sulphate of quinine, a person came in, soon followed by another. Having served the quinine, the man who first came in, instead of stating what he wanted, turned round and surveyed the shop, and the other politely declined to be served as No. 1 came in first, and as No. 1 stated that his order would take some time to execute, he would wait: accordingly No 2 was served, and he departed. I had some difficulty in ascertaining what the other wanted; it however turned out to be logwood and alum, and as he wished to go further, he would call again for the articles. As my customer did not return, I began to suspect something wrong, and, on looking round the shop, found the bottle of quinine was missing!"

BOOKS RECEIVED.

Special Therapeutics; an Investigation into the Treatment of Acute and Chronic Diseases, by the Application of Water, the Hot-air Bath, and Inhalation. By J. C. Long Marsh, M.D., etc. London: Robert Hardwicke, 192, Piccadilly. 1863.

On Glycerine, and its Uses in Medicine, Surgery, and Pharmacy; being principally an abstract of M. Demarquay's Treatise, 'De la Glycérine,' etc. By W. Abbotts Smith, M.D. London: H. K. Lewis, 15, Gower Street North. 1863.

TO CORRESPONDENTS.

The 'British Pharmacopœia.'—In reply to several correspondents, we are authorized to state that the 'British Pharmacopœia' will appear early in January next. The work will be published by the "General Council of Medical Education and Registration," 32, Soho Square.

L. M. (Wakefield).—*Sugar of Milk* is generally made by evaporating *whey* to a syrupy consistence, when the sugar crystallizes out, and is afterwards purified with animal charcoal.

Inquirer (Cardigan).—We know nothing of the oil mentioned by our correspondent.

S. T. B.—See 'Pharmaceutical Journal,' vol. x. pp. 115, 168, 236, 297, and 340; and the papers by Professor Bentley, "On the Cultivation of Medicinal Plants at Hitchin," Pharm. Journ. vol. i. 2nd series, pp. 275, 323, 414, and 515.

A Student.—Apply to the Secretary of the Pharmaceutical Society, giving name and address, and he will forward you the required information.

A Registered Apprentice (Gloucester).—Bentley's 'Manual of Botany,' and Royle's 'Materia Medica.'

Index.—The Index to the first fifteen volumes of the 'Pharmaceutical Journal and Transactions' may be obtained of the Secretary, at the reduced price of 2*s.* 6*d.*

"*A Young Chemist.*"—The substance sent for examination is *Naphthaline.*

"*A Lincolnshire Member.*"—*Black Writing-ink.* See vol. vii. p. 183, and vol. xii. p. 69.

C. H. E. M. (London).—(1) We know of no better method than that in ordinary use. (2) The substance referred to is, we believe, a mixture of kaolin and solution of gutta-percha.

J. G. (Kendal).—When *creta preparata* is ordered in a prescription, it would not be correct to use *creta præcipitata.*

Gray's Supplement to the Pharmacopœia—A Correspondent (Brighton) points to an error in the 3rd edition, 1857, of Gray's Supplement to the Pharmacopœia (Redwood)—in the formula given for *Electuarium Catechu*, in which ℥iss of opium is ordered instead of ʒiss, and observes that as the work is so constantly consulte by the trade, it seemed desirable to point out the oversight.

E. W.—*Coating Pills.* See vol. iii. (Second Series), page 562.

M. P. S.—*Unguentum Sulphuris Hypochloridi Compositum*, vol. x. p. 66.

An Apprentice (Colchester).—*Confectio Rosæ Caninæ.*

S. A (Leeds).—*Prepared Cochineal*, vol. x. p. 260; if desired, Carmine may be sustituted for the Cochineal, using, of course, a much smaller quantity of the former.

H. P. (Stourbridge).—(1) The solution should be filtered. (2) Yes.

Justitia (Manchester)—(1) None but Pharmaceutical Chemists have the privilege of using the arms of the Pharmaceutical Society. (2) Any one who writes over his shop-window the words "Pharmaceutical Chemist," unless he is on the Register of the Pharmaceutical Society, is liable to be proceeded against under the Pharmacy Act.

Mr. Charles Ekin (Bath), *Mr. T. W. Wing* (Melton Mowbray), are thanked for their communications.

J. B. G.—A paper on the subject will be published in the next number of the Journal.

E. L. (Hexham), will find the information he wants in vol. viii., pages 467 and 512, of this Journal.

H. C. (Ipswich).—The solution will be best effected with recently precipitated oxide of iron.

ERRATA.

Page 229, line 9 from the top, *for* "as true with as without them" *read* "as true without as with them."

Page 230, lines 18, 19, and 20 respectively, *for* "himself" and "he" and "him" *read* "themselves," "they" and "them."

Instructions from Members and Associates respecting the transmission of the Journal before the 25th of the month, to ELIAS BREMRIDGE, Secretary, 17, Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Mr. CHURCHILL, New Burlington Street. Other communications to the Editors, 17, Bloomsbury Square.

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. V.—No. VII.—JANUARY 1st, 1864.

THE PROPOSED MEDICAL BILL AFFECTING PHARMACY.

The United Society of Chemists and Druggists has just held a meeting of the trade, "*to take into consideration the best means of preventing the unwarrantable interference of the Medical Council with the rights of Dispensing Chemists*," and it is interesting to read the opinions of the various gentlemen who took part, and the resolutions which were proposed thereat.

With one exception (we read the report of the meeting in the 'Chemist and Druggist') every speaker acquiesced cordially in the necessity for an educational qualification, thereby justifying entirely the opinion of the Medical Council, that something should be done. The point at issue seems to be, *who shall do it?*

To us it appears to be a great pity, and a great mistake, to regard the Medical Council and the whole body of Chemists and Druggists as enemies one to the other: to suppose for one moment that the Medical Council, or any branch of the profession forming that Council, has any desire to monopolize the dispensing of medicine, or the traffic in drugs, is altogether opposed to the whole course of events in the profession during the last twenty years. There are the three divisions of Physicians, Surgeons, and Apothecaries. Man is ambitious,—it may be well for the progress of society that he should be so to a certain extent,—and we think even Apothecaries may be somewhat aspiring. They have no desire to be considered the "caitiff wretches" whom Shakspeare knew, and nine out of ten of them would hail the day which severed them from their dispensaries as one to be marked thereafter in their calendars as a "red-letter day," a day on which the last link was broken which bound them to a *quasi*-trade, and prevented their claiming that full and free equality with Consulting Surgeons and Physicians they have so long desired. There is abundant evidence to support this conclusion in every place large enough to support such dispensing chemists as will enable the general practitioners to become the *prescribers* rather than the *vendors* of physic to their patients. It is not a mere question of *status* which makes such a course desirable. Everybody can sympathize with a gentleman who, being unable by custom to charge for advice, is compelled to drench his patient with physic to obtain anything like remuneration for his services. The medical journals openly advocate such a change. We would not be thought to disparage that branch of the profession which is thus passing from the apothecaries to the chemists,—the mere fact of the severance of the prescriber from the dispenser would remove the reproach; there would no longer be interest in giving, or the necessity to give, *three draughts a day*, with *something extra now and then.*

Interest carries men a long way, and there does not seem to be any interest to induce the Medical Council to oppress Chemists and Druggists. If any one will attentively read through the Medical Act of 1858, he will be perfectly satisfied that its object was to gather into one department—to centralize, if you will—all that relates to physic or surgery. The whole profession was to be regulated thereby, and each branch of it was to be represented therein. The existing Examining Boards were recognized and continued, but certain powers were given to the General Council to interfere if the examinations should at any time fall short of the necessary standard (*vide* clause 20, Medical Act).

And now it is deemed desirable to add Pharmacy to Physic and Surgery. Of its intimate connection therewith, no doubt can exist. The means proposed may not be perfect,—they are open to amendment,—but we cannot regard the spirit of the proposition as inimical or intolerant.

The Council has not started an examination to be conducted by any body of men other than Pharmaceutical Chemists themselves (the rights of the Apothecaries' Company being of course reserved as heretofore), and it has named the only authorized Examining Boards now in existence as sufficient for its purposes.

We would not be insane enough to hand Pharmaceutical Chemists, bound hand and foot, over to Physicians, Surgeons, and Apothecaries; but when a proposal for an object which we all admit to be desirable is made in a liberal spirit, we would meet it with a like spirit. Half the individual grievances of the world are brought on by men trying to elbow their way through it; angular bodies do not pass each other comfortably, and it is far wiser to reserve such means of progression until they are needed; improperly used, they often retard progress. But few professions or trades stand entirely alone, and certainly Pharmacy does not.

One extravagant fear which seems to have taken possession of the minds of some Chemists and Druggists on the present occasion seems to be that the proposed Act would extinguish existing rights. Such legislation never occurs in England. Let them look back to the Apothecaries Act of 1815, and then let them satisfy themselves, by a reference to the 'Medical Directory,' that many practitioners even now, just half a century after the passing of that Act, hold no other authority for their position than that of having been "*in practice prior to* 1815."

There may be a registration to protect vested interests, but there could be no great hardship in that. Such a registration was offered in 1853 when the Pharmacy Act was granted on the voluntary principle,—there was no exclusiveness in the invitation to join; and had the prospect of any compulsory measures been sufficiently distinct at that time there would be no occasion for alarm now.

THE BENEVOLENT FUND.

There is a page in our present Journal which will, we think, be perused with pleasure by every reader,—that which contains the statement of the receipts and disbursement of the Benevolent Fund for the past year.

In drawing attention to this fund at the end of 1862, we ventured to remind the members of the Pharmaceutical Society of its importance, of the easy means by which it might be enriched, and of the fact of its having been one of the original objects contemplated in the formation of the Society; and it is now no small satisfaction to find the subscriptions and donations of 1863 are more than fourfold those of the preceding year. We have had two unusually large donations—larger perhaps than we may be justified in expecting frequently—and this should be an incentive to those who are not already subscribers to come forward with their smaller sums, and to Local Secretaries to endeavour to collect such contributions with the ordinary annual subscriptions from members and associates, that the gross receipts of 1864 may not fall short of 1863.

We are aware that some members have hinted an opinion that more relief might have been granted from this fund—not that larger sums might have been given to the applicants who have been assisted, or that any have applied in vain, but that the Council should have sought out necessitous members, and, ere this have established pensioners. Until the present time no person has ever asked for a pension. When the scheme for the administration of the Benevolent Fund was formed, it was understood that before carrying it out fully, a capital of £10,000 must be invested. This was establishing a true and sound foundation, for it must be obvious to all that to grant a pension from any other source than the interest of capital would be a delusion and a snare; to fix an annuitant on a fluctuating income, such as annual subscriptions, which accidental circumstances may lessen or even entirely destroy, would be to risk disappointment to the annuitant at that period of life when it would be most distressing. It may be true that with less than £10,000 some permanent relief might be settled, but we feel assured that until that sum is invested, the grants, whether annual or occasional, should never exceed—indeed, should scarcely equal—in amount the interest of capital; and we therefore hail it as satisfactory that the whole of the subscriptions and donations, as well as a considerable portion of the dividends, have hitherto been added to stock.

It will be seen, that two of the recipients of relief from the Benevolent Fund, in 1863, were members, and two widows of members of our Society. Each of the former received £25; to one it was a second donation, he is a man greatly afflicted in health, and has a wife and seven children to support; the other is sixty-six years of age, also incapacitated by illness, and the father of four children, of whom the eldest is but fourteen. Of the widows, one is eighty years old, blind, and dependent on the care of an invalid daughter.

From such cases as these there would seem to be little difficulty in selecting fitting annuitants.

THE SALE OF MEDICATED WINES.

A short time since we received a letter from Mr. Woolley, of Manchester, informing us that the Excise Officers of the district had inquired of him whether he sold *Orange Quinine Wine;* on being answered in the affirmative, they asked if he held a *Sweet Wine Licence*, or if not, if he affixed a medicine stamp to each bottle of the article sold.

The facts seemed so startling that it was deemed advisable at once to apply to the Commissioners of Inland Revenue for specific information as to the liability of Chemists in these matters. The subjoined correspondence will put our readers in possession of the views of the Commissioners:—

17, *Bloomsbury Square, Nov.* 10, 1863.

To the Honourable

The Commissioners of the Inland Revenue.

Gentlemen,—I beg very respectfully to draw your attention to, and to solicit information on a subject of much importance to the public generally, but of especial consequence to Pharmaceutical Chemists, and other retailers of Medicine,—the sale of Medicated Wines.

It may be convenient that I should state that this matter has recently been brought before your Honourable Board by Mr. George S. Woolley, of Manchester, and that a reply has been sent to him, signed "Wm. Corbett, Secretary," and marked in the margin $\frac{66145}{63 J.}$

Mr. Woolley is therein informed that it is, by law, necessary that he should take out a "Sweets Licence" for the sale of his "Orange Quinine Wine," but

that the Board will not insist on his doing so "if the wine be sold under the Patent Medicine Licence, and have a stamp on each bottle."

I cannot say whether there was any special circumstance in Mr. Woolley's case, in the wording of his label or otherwise, which made him liable to the licence or stamp, or that rendered the one avoidable by the adoption of the other; but I beg most respectfully, on behalf of the Pharmaceutical Chemists of Great Britain, whom this Society represents, to ask, *whether the sale of Medicated Wines, prepared either with British or Foreign Wine, does really involve the necessity to the vendor to possess a licence of any kind?*

I may submit to you that for centuries, wine of various kinds has been used as a menstruum for medicinal substances, and instance as familiar examples, *aloes, antimony, colchicum, ipecacuanha, rhubarb,* and *steel,*—these are compounds of foreign wines; but more recently advantage has been taken of the acid and aromatic properties of Orange Wine to use it as a solvent for quinine, the particular preparation now brought in question.

All these articles are used as medicine, and *medicine only.* By the admixture of drugs they are entirely taken out of the category of "*beverages*," and, whether by special exemption or common understanding I know not, they have always been sold without licence by chemists.

Feeling assured that your Honourable Board can have no wish to throw impediments in the way of medical science, or of trade, I venture to hope that you will kindly vouchsafe me the information now sought, and to subscribe myself with all respect,—Your most obedient servant,

GEORGE W. SANDFORD,

President of the Pharmaceutical Society of Great Britain.

(Answer.)

Inland Revenue Office, 3rd *Dec.,* 1863.

Sir,—I am desired by the Commissioners to inform you, in reply to your letter of the 10th ultimo, respecting the sale of "Medicated Wines," that they are advised that whenever the articles are held out by label or advertisement as beneficial to persons suffering from any ailment affecting the human body, they can only legally be sold under a Patent Medicine Licence, and with a stamped label on each packet; and also, in strictness, under an Excise foreign or British Wine Licence, according to the character of the wine.

The Board however have instructed me to add, that except in cases where there may be reason to believe that a beverage is being sold under colour of a medicine they will not interfere with the sale, without an Excise licence, of medicated wines of the description adverted to, provided that such medicines do not fall under the category of patent medicines.—I am, Sir, your obedient servant,

WM. CORBETT.

G. W. Sandford, Esq.

We were at first at a loss to conceive that the name of Orange Quinine Wine could ever have been used as a colourable pretext for avoiding a licence: it certainly was not so used in Mr. Woolley's case; but rumours have reached us that there has been an appearance of evasion in some cases, that a preparation has been sold of which *three or four glasses may be taken at any time,* and if this be true, the interference of the Excise is explained. We trust no member of our body would stoop to such a proceeding, and feel assured we can only continue to enjoy that courtesy and consideration which has always been shown us by the Board of Inland Revenue, by discountenancing such tricks.

TRANSACTIONS

OF

THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *December 2nd*, 1863,

Present:—Messrs. Bird, Deane, George Edwards, Hanbury, Haselden, Herring, Hills, Horner, Meggeson, Morson, Reynolds, Sandford, Savage, Squire, and Waugh,

The following was elected a

MEMBER.

Mr. John Tuck..........................Wilton, near Salisbury.

BENEVOLENT FUND.

The following was announced as received during the month of November.

SUBSCRIPTIONS.

Duffin, Thomas, Huddersfield	0	10	6
Garle, John, Bromley	1	1	0
Thomas, John A., Harrogate	0	5	0

DONATIONS.

Cocher, Thomas A.	1	1	0
Floyd, James	1	1	0
Smith, Clarke	1	1	0

MAJOR EXAMINATION, *Dec. 16th*, 1863.

Hoskin, Montague John Roberts ....Southampton.
Millar, Frederick Charles Moss..........................Beaminster.

MINOR EXAMINATION.

Bingley, John..........................Retford.
Bird, Robert ....Newark.
Dyer, Abraham Johnson..........................Gosport.
Greaves, William Samuel ....Ironville.
Hooper, Leonard..........................London.
Iliffe, Thomas Perkins ....Nuneaton.
Mayfield, John Thomas..........................Wolverhampton.
Reece, John..........................Rotherham.

REGISTERED APPRENTICES.

NAME.	RESIDING WITH	ADDRESS.
Barker, Charles William	Mr. Radley	Sheffield.
Bennett, George	Messrs. Harrison & Hulley	Chesterfield.
Bingley, Richard	Mr. Tanner	Exeter.
Brady, Alfred	Mr. Brady	Newcastle-on-Tyne.
Burbidge, Edwin	Mr. Maitland	London.
Cave, Alfred	Messrs. T. & E. Anderson	London.
Croft, William	Mr. Frost	Derby.
Davies, John Hugh	Mr. Brady	Newcastle-on-Tyne.
Duberly, George Smith	Mr. Owen	Highbury.
Fever, William	Mr. Cuthbert	Bedford.
Glaisyer, Herbert	Harvey and Reynolds	Leeds.
Hitchcock, Charles Garrad	Mr. Hitchcock	Oxford.

NAME.	RESIDING WITH	ADDRESS.
Hopper, Charles Barton	Mr. Brearey	Douglas, Isle of Man.
James, Thomas Burvill	Dr. A. Gill	Dover.
Jones, John	Mr. Evans	Cardigan.
Lake, John Hinton	Mr. Tighe	Exeter.
Loggin, Leyton	Mr. Loggin	Stratford-on-Avon.
Palmer, William Francis	Mr. Woodward	Nottingham.
Phillips, Thomas	Mr. Davies	Cardigan.
Ray, William Herbert	Mr. Holman	Barnet.
Sawdon, Frederick John	Mr. Coulson	Scarborough.

ERRATUM.—Page 241 line 7, *for* "Galashiels" *read* "Musselburgh."

PHARMACEUTICAL MEETING,

December 2nd, 1863;

MR. G. W. SANDFORD, PRESIDENT, IN THE CHAIR.

The following

DONATIONS TO THE LIBRARY AND MUSEUM

were announced, and the thanks of the meeting given to the respective donors thereof:—

The Chemical News.
The Chemist and Druggist.
The Dental Review.
The British Journal of Dental Science.
The Photographic Journal.
The Educational Times.
The Technologist.
The Journal of the Society of Arts.
The Veterinarian.
The Medical Circular. From the respective Editors.
Bulletin de la Société de France.
The Journal of the Chemical Society.
The Journal of the Institute of Actuaries.
Transactions of the Medical and Chirurgical Society. From the respective Societies.
Beiträge zur Materia Medica China's. Von Daniel Hanbury. Uebersetzt von Dr. Theo. W. Martius.
A Manual of Ophthalmoscopic Surgery. By Jabez Hogg. From the respective Authors.
Specimen of Root Bark of Calisaya. From Mr. John Eliot Howard.
Specimen of Calabar Beans. From Mr. T. H. Hills.
Specimen of a New Kind of Matico. From Professor Bentley.

The following papers were then read:—

ON A NEW KIND OF MATICO, WITH SOME REMARKS ON OFFICINAL MATICO.

BY PROFESSOR BENTLEY, M.R.C.S. ENG., F.L.S., ETC.

PROFESSOR OF MATERIA MEDICA AND BOTANY TO THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN, ETC.

HISTORY.—Under the name of *matico*, *matecô*, or *matica*, the leaves of several plants are employed by the inhabitants of Central and South America, for arresting both external and internal hæmorrhages, and for other purposes. A nearly similar story is told throughout America, as to the discovery of the styptic pro-

perty of each kind of matico. It is said, that a Spanish soldier named Matico, when desperately wounded, dragged himself into the shade of the plants near him, and in his agony plucked some of their leaves, and applied them accidentally to his wound, when to his great surprise and delight, he found in a short time that the bleeding was arrested, and the wound soon healed. From this circumstance Matico has received the Spanish names of "Yerba soldado," and "Palo del soldado," signifying "Soldier's herb," and "Soldier's tree." Three plants have been especially mentioned by authors as having received the name of Matico, or Soldier's herb, namely, *Artanthe elongata*, Miq.; *Eupatorium glutinosum*, Kunth;* and *Walteria glomerata*, Presl.† The latter has not as yet been noticed in Materia Medica works, and I have seen no specimens of it; indeed, was unacquainted with it until my attention was recently directed to this kind by Dr. Seemann. Specimens of the two other varieties of matico may be seen in the museum of the Pharmaceutical Society, and are now on the table. The first, namely, that which consists of the leaves of *Artanthe elongata*, Miq., is the only one that has received any special attention, or the action of which has been tested, beyond its native country. This kind of matico is a native of Peru, where it is very highly extolled as a vulnerary, and for its aphrodisiac and other properties.‡ It was introduced to the notice of the medical profession in England, as far back as 1839, by Dr. Thomas Jeffreys, of Liverpool,§ and it is noticed in a paper by Mr. Morson, entitled "Observations on certain Plants of the genus Piper," which was published, and the plant well figured, in the third volume of the 'Pharmaceutical Journal.'‖ It was subsequently introduced into the Dublin Pharmacopœia in 1850, and formulæ therein given for the preparation of "tincture" and "infusion of matico." In England it has not been generally much esteemed as a medicinal agent for internal administration, and its action even when locally employed to arrest bleeding, has been regarded by some writers of eminence, as simply mechanical,—the peculiar structure of the leaves of which it is composed, being supposed to divide the blood, and thus promote its coagulation.¶ The committee appointed by the Medical Council to frame the forthcoming 'British Pharmacopœia' have however, and as I think properly so, thought matico of sufficient importance to be introduced into the list of Materia Medica to be published in that volume, and have also given a formula for the preparation of "Tincture of Matico." In the States of North America, matico has been much employed of late years, and highly extolled for its power of arresting internal hæmorrhage;** and has been introduced into the Primary List of the Materia Medica of the new United States Pharmacopœia, which has been just issued. The fact of matico having thus been, or about to be, introduced into the new United States and British Pharmacopœias, makes everything relating to it of especial importance at the present time, and hence, I have thought it a desirable subject to be introduced to the notice of this meeting.

From the great demand for matico which has recently arisen, in consequence principally of its extensive use in the States of North America, through the war which is now unfortunately desolating that enormous tract of country, it has become scarce and of high price; and indeed, at the present time, true matico—that which is to be officinal in the new British Pharmacopœia—is scarcely to be obtained in any quantity in this country. This scarcity of true matico,

* Lindley's 'Medical and Economic Botany,' p. 227.
† Seemann's 'Botany of the Voyage of H.M.S. Herald,' p. 85.
‡ 'Pharmaceutical Journal,' vol. ii. p. 660.
§ 'Lancet,' Jan. 5, 1839, p. 567.
‖ 'Pharmaceutical Journal,' vol. iii. pp. 472 and 525.
¶ Pereira's 'Materia Medica and Therapeutics,' 4th edit. vol. ii. part 1, p. 397, and Wood and Bache's 'United States Dispensatory,' 11th edit. p. 494.
** Carson's American Edition of Pereira's 'Materia Medica.'

and the impossibility of immediately supplying the demand, has probably led to the recent large importation of the leaves of another plant under the same name; and the object of this paper is, more especially, to direct attention to, and to describe that substance.

My attention was first called to this matico about six weeks since, in consequence of receiving from a well-known herbalist, in extensive business in London, a sample of a drug which had been recently imported, and which consisted of dried broken leaves, some small pieces of branches, and a few spikes of flowers. I was requested to inform him as to its nature, and the name of the plant which yielded it. Upon examination, I saw directly, from the odour and botanical characteristics of the drug that it had been derived from a plant of the Order PIPERACEÆ, and most probably from a species of the same genus as that yielding the officinal *matico*. Further examination clearly exhibited that my first conjecture was correct, and that it had been obtained from a species of *Artanthe*. Upon further inquiry I found that some genuine matico, and some of the present drug also under the name of matico, had recently arrived in the 'St. Thomas,' from Colon, a port situated at the terminus of the Panama railroad, on the Atlantic side. The drug had been consigned to a merchant in this city, and was afterwards offered for sale as matico, by a highly respectable firm of brokers. The respectability of all the parties concerned in this country, and elsewhere, who had knowledge of the transaction, and the public manner in which the drug had been offered for sale, showed that no fraud was intended, but that it was supposed to be, either true matico; or a substance allied to, and analogous in its properties to that drug, and probably known in the district from whence it had been forwarded under the same name.

Having now got a clue to the botanical and geographical source of the new drug, I went to the British Museum, where every opportunity was kindly afforded me by Mr. Carruthers of consulting the necessary books upon, and the dried specimens of, the different species of Artanthe which were preserved in the Museum collections. As there are nearly two hundred species of this genus, natives of the West Indies and of Central and South America, described by Miquel, the standard authority of the Order *Piperaceæ*;* and from the fact of my only having some broken leaves, and a few small pieces of the branches and flower-spikes, for examination and identification, the task, as may be supposed, was by no means an easy one. At first, I thought from its having arrived with some genuine matico, and also from the resemblance it bore to a specimen in the Museum collection, marked *Artanthe elongata*, Miq., which was stated to be derived from South America, and obtained from Pavon's Herbarium, that it might be like true matico, also obtained from *Artanthe elongata*. Its marked difference from ordinary commercial matico, however, and a more minute examination, were opposed to this supposition. I then carefully compared my specimen with the other dried specimens of *Artanthe* in the Museum, and after a minute critical examination and comparison with them, I came to the conclusion that it corresponded most nearly with that marked *Artanthe adunca*, Miq. Further examination of Miquel's 'Systema Piperacearum,' as well as the works of Jacquin, Ruiz et Pavon, and of other authors which refer to the botanical characters and geographical sources of *Artanthe adunca*, have satisfied me, so far as it is possible for me to be so, from the examination of the imperfect specimens in my possession, that this new kind of matico is derived either from one of Miquel's varieties of *Artanthe adunca*, or from a species very nearly allied to it, and which can only be determined satisfactorily by the examination of more perfect specimens than those in my possession. I believe, however, that the species yielding it will turn out to be *Artanthe adunca*.

* Miquel's 'Systema Piperacearum.'

Since my examination of the above sample, I have had an opportunity of inspecting other samples at the same broker's from which it had been obtained, and I found that all of them consisted essentially of the leaves of the same plant as that just mentioned, but in some there was a little genuine matico, and the leaves, etc., of apparently some other species besides those already alluded to, mixed with them in varying proportions. The following are the synonyms, botanical characters, and geographical sources of *Artanthe adunca*, Miq.:—

SYNONYMS.—*Artanthe adunca*, Miq.; is the *Piper aduncum*, Linn.; *Piper arborescens*, Mill. Dict.; *P. scabrum*, Lam. Ill.; *P. lanceolatum*, Salzmann; *Steffensia adunca*, Kunth; and the *Piper longum, folio nervoso pallide viridi humilius*, of Sloane. The first name is that now generally employed by botanists. In common language it is known under the names of Hooked-spiked Pepper, and Spanish Elder.

Etymology.—The generic name of *Piper* appears to have been derived from *pippul*, the Bengalese name of the Long Pepper, although some authors ascribe it to πεπτω, πεπερι, to digest; that of *Artanthe* is from αρτυμα, seasoning, spice, and ανθος, a flower. The specific name *aduncum*, refers to its curved or hooked spike of flowers. The origin of the common name of Hooked-spiked Pepper is at once manifest; that of Spanish Elder, by which it is known in Jamaica, is derived from its protuberant jointed stems somewhat resembling those of the common Elder.

BOTANY.—The genus *Artanthe* is now universally placed in the Natural Order *Piperaceæ*.

Generic Character.—*Spikes* solitary, opposite the leaves. *Flowers* hermaphrodite. *Style* none. *Bracts* peltate or cucullate.*

Specific Character.—The following description is taken from Miquel:—†

"Ramis ramulisque striatis aspero-verruculoso-punctulatis, junioribus appresse hispidulis, foliis breviter petiolatis, rigido-membranaceis pellucido-punctulatis, supra opacis scabriusculis, subtus pallidis puberulis, lato-oblongis vel (summa) sublanceolato-oblongis, plus minus inæquilateris, acuminatis, basi leviter inæquali rotundatis, lineato-multi-(6–7)-costatis, amentis erectiusculis folio brevioribus, falcatim curvatis, pedunculo petiolum quater vel quinquies superante, bracteis peltatis, ciliato-fimbriatis, baccis obovato-tetragonis, vertice subrotundatis, semine conformi leviter areolato."

Miquel also enumerates the following four varieties:—*Forma foliis omnibus lanceolato-oblongis*, from Jamaica; *Forma foliis angustioribus*, from French Guiana; *Forma caule ramisque glabris*, from Porto Rico, etc.; and *Forma foliis rugosioribus et magis scabris*, from Brazil and Bahia. Hence it is evident that the species varies much according to its geographical source, which renders it more probable that, although the new matico differs in some minor details from Miquel's description as given above, as it agrees in the main with it, we are correct in referring it to *Artanthe adunca*, Miq.

Habitat.—*Artanthe adunca* has a wide geographical distribution throughout the tropical regions of America. It has been found in Jamaica, Barbadoes, San Domingo, Porto Rico, the Caraccas, Surinam, Bahia, Valencia, Guiana, and the Brazils. Its wide geographical distribution is an additional argument in favour of the present kind of matico being derived from it.

GENERAL CHARACTERISTICS.—As imported, this new kind of matico consists chiefly of dried, more or less broken, loosely aggregated or somewhat compressed fibrous leaves; together with a very few flower-spikes; and small fragments of branches. It has a greenish colour; a strong, agreeably aromatic,

* Miquel's 'Systema Piperacearum;' and Lindley's 'Medical and Economic Botany,' page 133.

† Miquel's Systema Piperacearum,' page 449. Figures of the plant may be seen in Sloane's 'Natural History of Jamaica,' vol. i. p. 135, tab. 87, fig. 2; and Jacquin's 'Icones Plantarum Rariores,' vol. ii. tab. 210.

and somewhat pungent odour, in some respects resembling that of true matico; and an aromatic, somewhat spicy, pungent taste.

More minutely examined, the *leaves*, (of which some may be found nearly entire), are then seen to be four, five, or more inches in length, and from one and a half to two and a half inches in breadth. They are oblong, oblong-lanceolate, or oblong-ovate in form, entire at the margins, acuminate-pointed, and somewhat unequal, and more or less rounded at the base. They have short petioles, which are channelled above, rounded beneath, and enlarged at the base, or part by which they were originally attached to the stem, and are commonly somewhat rough, or more or less hairy or pubescent. They have a somewhat membranous texture. Their upper surface is dark-green, opaque, and commonly more or less rough, although in some specimens they are nearly smooth; they are without hairs, and have from four to six somewhat sunken veins, arising alternately on each side of the midrib, and passing upwards parallel to, and approaching each other above, and ultimately terminating at the margins. Towards the base are several other smaller veins, which pass at once to the margins of the leaf. The under surface is pale-green, with prominent light-coloured veins, which in number and direction correspond to the veins above; these divide more or less, and give a corresponding, more or less reticulated character to the surface. There are commonly no hairs between the ramifications of the veins (although in some leaves these may be found); but the veins themselves are usually more or less pubescent, and in some cases very evidently so.

The *stalks* are striated, more or less compressed, somewhat rough from the presence of minute tuberosities on the surface, and are furnished at intervals with prominent nodes.

The *flower-spikes* are slender, of a cylindrical shape, yellowish or brownish in colour, closely covered with minute flowers, more or less hooked, curved, or twisted, and three or more inches in length.

It will be seen from the above characteristics that, the new kind of matico may be at once distinguished from the officinal and old kind of matico, by the leaves, etc., being in a less compressed state than in it; by their more fibrous nature, which makes them more difficult to reduce to powder; by their upper surface not being so tessellated or rough; and generally, by the almost entire absence on the under surface of pubescence, and in all cases, far less pubescent character. Hence the tessellated upper surface, and very pubescent character of the lower surface of the leaves constituting true matico are, at once sufficient to distinguish them from the leaves of the new kind of matico.

Composition and Chemical Characteristics—The chemical composition and characteristics of officinal matico were investigated as far back as 1844, by Dr. John F. Hodges, and the results communicated to the Chemical Society.* He found the following substances in it:—*an aromatic volatile oil*, *a bitter principle*, which he termed *maticine*, *a soft dark-green resin*, *chlorophyll*, *a brown colouring-matter*, *a yellow colouring-matter*, *gum*, *nitrate of potash*, *salts*, and *lignin*. It was subsequently analysed by Mr. Wiegand, of Philadelphia, and according to him, the so-called *maticine* of Dr. Hodges is nothing more than a salt of potassa. Mr. Stell, in an inaugural essay presented to the Philadelphia College of Pharmacy, in March, 1858, confirms the conclusion of Mr. Wiegand, as to the non-existence of the *maticine* of Dr. Hodges; and he failed in obtaining any principle from matico, similar to *piperine* or *cubebine*, and which from its being derived from a nearly allied plant it might have been supposed to contain.† Mr. Stell concluded from his experiments that the medicinal properties of ma-

* Proceedings of the Chemical Society, vol. ii. p. 123, for 1844; and Pharm. Journ. vol. iv. 1844–45, p. 286.

† 'American Journal of Pharmacy,' vol. vi. 1858, p. 392; and Proceedings Amer. Pharm. Assoc. for 1859, p. 49.

tico depended upon the volatile oil and soft resin. The resin obtained by Mr. Stell was of a ruby-red colour, and hence he concluded that the green colour of the resin of Dr. Hodges, was due to the admixture with it of chlorophyll.

An infusion of the broken-up leaves reduced to coarse powder of the *new kind of matico*, in the proportion of one ounce to thirty ounces of boiling water, and allowed to macerate for twenty-four hours, had a dark clear reddish-brown colour, somewhat resembling brown sherry, and not distinguishable in this respect from an infusion of true matico, made of the same strength and in a similar manner to it. It had an agreeably aromatic, and somewhat spicy, pungent odour; and an aromatic, agreeable, somewhat spicy, pungent taste. In the two latter respects it resembled the infusion of true matico; but was more agreeable than it, and somewhat more pungent. It exhibited the following reactions:—*Tincture of iodine* heightened the colour considerably, and produced a slight opacity, but no precipitate; *solution of persulphate of iron* caused a deep brownish-blue-black coloration, and a plentiful brown precipitate; *solution of perchloride of iron* caused a deep bluish-green-black coloration, but no precipitate; *solution of ferridcyanide of potassium* simply heightened the colour; *solution of acetate of lead* caused an abundant yellowish-brown, light precipitate; *solution of baryta*, an abundant, somewhat gelatinous-like, yellowish-brown precipitate; *solution of nitrate of baryta*, a plentiful, whitish, light, flocculent precipitate; *solution of nitrate of silver*, a plentiful, flaky, gelatinous-like, yellowish-white-brown precipitate; *solution of sulphate of copper*, an abundant brownish, light flocculent precipitate; *solution of bichloride of platinum*, an abundant yellowish-white, light precipitate; *solution of protochloride of tin*, a plentiful reddish-brown precipitate; *solution of chloride of calcium* produced no evident effect at first, but slowly an evident whitish light floating precipitate was formed; *solution of sulphate of lime* also had no marked effect at first, but ultimately caused a slight whitish precipitate; *solution of chloride of lime* at first heightened the colour, which afterwards slowly lessened again, and a plentiful whitish precipitate was formed; *tincture of galls* caused an opaque muddy appearance, and a very slight precipitate; *hydrochloric acid* caused an abundant, whitish, more or less floating precipitate; *nitric acid*, a plentiful, brownish, light precipitate; and *sulphuric acid* an abundant brownish, light precipitate. No very evident effects were produced by the addition to the infusion of either *blue* or *red litmus papers;* or by that of *turmeric paper;* nor by *acetic acid;* nor by any of the following solutions:—*Solution of potash, chromate of potash, ferrocyanide of potassium, antimoniate of potash, carbonate of potash, potassio-tartrate of antimony, gelatine, ammonia, oxalate of ammonia, sulphate of soda,* and *bichloride of mercury.*

An infusion of *officinal matico* was made at the same time as the above, of the same strength, and in other respects like it; and when it was submitted to the action of the various reagents just mentioned, the effects produced were in all cases almost identical with those caused in the infusion of the new kind of matico. I have given the action of the reagents in full, as the list is more extended than any hitherto published. The reactions obtained by Dr. Hodges, so far as he investigated them, agree essentially with my own.

From the similar action of the various reagents upon the two kinds of matico, I may fairly conclude that their composition must be nearly identical; and there can be little doubt therefore that, the medicinal properties of the new matico are also due to the presence of an essential oil and resin. The presence of the volatile oil is at once made evident by submitting the leaves previously macerated in cold water, to distillation. Some of the product then obtained, which has been distilled for me by Mr. Tilden in our laboratory, is now on the table, and as may be noticed, it possesses the peculiar odour of the dried leaves. It is evident from the above that the best form of administration would be an alcoholic extract or tincture.

MEDICINAL PROPERTIES AND USES.—With regard to the medicinal properties of this new kind of matico, I think we may safely conclude, from its chemical, botanical, and physical resemblances to that of true matico, that they must be also nearly identical, at least when administered internally, to it. Its local action, when applied externally to arrest hæmorrhage, would be doubtless, to some extent, less powerful than that of true matico, as its structure would not act mechanically to the same extent as it; indeed, those who believe that true matico in such cases acts simply from its peculiar structure dividing the blood and thus promoting its coagulation, would attribute little, if any, value to this kind of matico; but I am convinced, from my own experiments, and from the recorded observations of others, as well as from various communications on the subject that I have received from practitioners in this and other parts of the world, that the power which true matico possesses of arresting hæmorrhage, when locally applied, cannot be due simply to its mechanical action.

That this new kind of matico does possess valuable medicinal properties is also probable from the fact of various parts of the plant yielding it, namely, the *Artanthe adunca*, having had, and at the present time being considered to have, a great reputation in various diseases in the different districts in which it is a native. The earliest notice that I can find of its medicinal properties and uses is in Sloane's 'Natural History of Jamaica,'* where the following abstract, taken by him from Piso's 'Natural History of Brazil,' published at Amsterdam in 1648, occurs:—"The fruits which are like Long-Pepper are of no use, the root is very famous. It has something aromatick, and in tast, colour, and smell, resembles ginger, especially if it be fresh, and then it is not inferiour to it. It is very hot and dry. A decoction of the leaves and roots cures the colic and pains of the limbs, eases the windy belly, and takes away the cold tumors of the feet. The same is done by baths and fomentations." Miquel, in his 'Systema Piperacearum,' already frequently quoted, says that the spikes of it and other species of *Artanthe* are used in the same manner as long pepper, for flavouring, seasoning, etc., and also an account of their medicinal properties. Martius also refers to the use of its spikes of fruits as a substitute for pepper in tropical America; and he moreover states that in Brazil, the leaves of *Artanthe adunca* have a similar reputation to, and are employed in the same diseases as cubebs, and that those of *Artanthe elongata* (true matico) are used in Peru in like manner.†

From the evidence now given, I think we can come to no other conclusion than —that this new matico is well worthy of a trial in this country in similar diseases to those in which the officinal matico has been found efficacious. The trial of its virtues is rendered still more necessary at present, on account of the scarcity and high price of true matico. This scarcity will be most probably but temporary, but it will certainly be rather anomalous and remarkable if, when the long and anxiously expected and desired stranger—the new Pharmacopœia—at length sees the light of day, one of the substances therein ordered cannot be obtained, or a substitute be at hand for immediate use until that deficiency can be supplied.

The PRESIDENT observed that as Professor Bentley had pointed out true Matico was scarce and dear, it was very important that any substitute which might be discovered should be at once brought before the notice of the Society; and this was more especially necessary at the present time with matico, as they had also been informed that it was to be introduced into the forthcoming British Pharmacopœia. He thought that it was very desirable that all new drugs should be introduced to their notice as soon as possible; in fact, this was one of the main objects of these meetings.

* Sloane's Nat. Hist. Jam. vol. i. p. 135.
† Lindley's 'Vegetable Kingdom,' p. 518.

Mr. SQUIRE said he could corroborate Professor Bentley's statement as to the scarceness and dearness of matico, and he was glad that this subject had been brought before them that evening. He also observed that the matico now in the market did not altogether present the same characters as when the drug was cheaper and more plentiful, for he had recently had occasion to operate upon some matico, and he must confess that he was quite unable to explain the results which he then obtained. When an alcoholic extract was made, a change occurred which he had not previously noticed when operating with matico in a similar manner. It consisted in the presence of a hard resin, which formed in one part of the extract, and there could be no doubt that its production was due to some change having taken place in the matico. It was a change, however, which, supposing it to be true matico which was operated upon, he was at a loss to understand.

As to the mode of action of matico as a styptic, he knew that there were many opinions. He had been recently induced to examine some samples of matico, and was struck with the fact of the entire absence in them of tannic and gallic acids. At the suggestion of a well-known physician, he was led at the same time to examine Ruspini's styptic, which was reported to contain a solution of gallic acid, but was surprised to find that there was not the slightest indication in it of the presence of that substance.

During the reading of the paper, however, he was especially struck by the similarity of odour in Ruspini's styptic and that of the oil obtained from the new matico exhibited by Professor Bentley, and rather than leave the matter in doubt, he was inclined to risk the opinion that the odour in both was due to the presence of the same oil. This, and other circumstances, also led him to believe with Professor Bentley, that the styptic action of matico was due essentially to the presence of this oil, and not to the structure of the leaf, which he thought quite insufficient to account for its remarkable effect in certain cases.

ON THE ACETIC ACIDS OF THE THREE PHARMACOPŒIAS.

BY HENRY DEANE, F.L.S.

When, in 1855, the Pharmacopœia Committee of the Pharmaceutical Society began its labours upon the Materia Medica of the three Pharmacopœias of England, Scotland, and Ireland, one of the first subjects was of singular confusion and difficulty, namely, Acidum Aceticum, there being no less than eight different strengths recognized by the three colleges, as follows:—

All the Acetic Acids contained in the three Pharmacopœias are here arranged according to their different strengths:—

E.	Acidum Aceticum	Sp. gr. 1065 = 85 per cent.	}
D.	" " Glaciale	Sp. gr. 1065 = 85 per cent.	}
D.	" " Forte	Sp. gr. 1066 = 51 per cent.	
L.	Acidum Aceticum	Sp. gr. 1048 = 30·8 per cent.	
D.	" " of Commerce	Sp. gr. 1044 = 28·0 per cent.	
E.	" Pyroligneum	Sp. gr. 1034 = 21·0 per cent.	
L.	" Aceticum Dilutum	Sp. gr. 1008 = 4·6 per cent.	}
L.	Acetum Destillatum	Sp. gr. 10065 = 4·6 per cent.	}
D.	Acidum Aceticum Dilutum	Sp. gr. 1006 = 3·5 per cent.	
E.	Acetum Destillatum	Sp. gr. 1005 = 3·0 per cent.	

Of these, the most important to pharmaceutists, and chemists and druggists in England, are the acetic acid of P. L., containing 30·8 per cent. of real acid, and the dilute acetic acid P. L., containing 4·6 per cent., compared with the acids with similar designations of the other two colleges; for it is in consequence of the great difference between them that much confusion and inconvenience have arisen.

Before the publication of the last London Pharmacopœia, the only diluted acetic acid recognized was the Acetum Destillatum, which was ordered to be prepared by the distillation of "vinegar," but it does not state whether the vinegar is to be French-wine vinegar or malt vinegar, and if the latter, what strength, whether *proof* or any other. From Mr. Phillips's notes in the P. L. 1836, I presume *proof vinegar* is the article intended to be used, and which is estimated to contain five per cent. of real acetic acid, a part of which is lost in the process of distillation. Hence distilled vinegar must necessarily be of variable strength, but is assumed by Mr. Richard Phillips, and I suppose by the College also, to contain 4·6 per cent. of real acid.

Hence, in the Pharmacopœia of 1851, where Acidum Aceticum Dilutum, prepared otherwise than by distillation, is first introduced, the proportion of strong acid to water therein ordered is such as to afford a dilute acid of the same strength, namely, 4·6. On turning to Paris's 'Pharmacologia,' sixth edition, published in 1825, under the article Acidum Aceticum Dilutum I find these words:—"Mr. Phillips states, that when prepared according to the directions of the Pharmacopœia it varies (in sp. grav.) from 1007 to 1009; and that 1000 grains of the latter require for their saturation 145 grs. of *subcarbonate of soda.* I apprehend, however, that it will be found quite impossible to obtain a dilute acetic acid equal in strength or specific gravity to that last mentioned, by the process of the London College; it may even be doubted whether it can be produced of the specific gravity 1007. The general run of distilled vinegar, as found in the shop of the druggist, varies from 1005 to 1006, and contains from 2·80 to 2·826 per cent. of real acid; when of the specific gravity 1009 it would contain about 4·73 per cent. Dr. Powell states ('Translation of the Pharmacopœia of London,' 1815) that 'one fluid ounce ought to dissolve at least thirteen grains of *white marble;*' or, what is equivalent to it, 39·67 grains of crystallized *subcarbonate of soda;* acid of this strength corresponds very nearly with six degrees of the revenue acetometer, the proportions being as follows:—100 grains of Pharmacopœia strength will saturate 8·68 grains of crystallized subcarbonate of soda; 100 grains of acid of 6° of the acetometer will saturate 8·70 grains of the salt." On referring to the acetometer table, I find that 6° is equal to 2·826 of real acid per cent., which is nearly two per cent. less than the indication of our present Pharmacopœia. The strength of distilled vinegar of the Edinburgh College is three per cent., and the dilute acetic acid of Dublin 3·5 per cent. It would therefore appear that the estimation of the strength of distilled vinegar by both these colleges is not far from correct, and that the practice of the Dublin College in ordering the dilution of the acetic acid of commerce (sp. grav. 1044) to afford an acid of 3·5 per cent. is not so far out of the way as to lead to any serious inconvenience. On the other hand, the assumption of the London College, that distilled vinegar contained 4·6 per cent. of real acid, has occasioned an incalculable amount of inconvenience and confusion, as I will endeavour to show.

I believe the first introduction of strong acetic acid into the London Pharmacopœia was in 1824, under the name of Acidum Aceticum Fortius, and was very nearly the same strength as that obtained by the process of the P. L. 1836, and still retained in the materia medica, although no formula is now given, namely, 30·8 per cent. Why that particular strength was adopted I am not prepared to say, except that it is very well adapted for the preparation of Acetum Cantharidis, which is a clear and efficient preparation. Previous to the introduction into the Pharmacopœia of this Acidum Aceticum, 30·8, Beaufoy and Co., of South Lambeth, had been in the habit, for many years, of preparing acetic acid of such strength that one pint of that and seven of water were directed to be mixed to produce an acid "equal to *distilled vinegar* used by *chemists, apothecaries,*" etc. This dilution, I find, affords an acid of about three per cent., the same as the distilled vinegar of the Edinburgh Pharmacopœia. This acid, called one to seven, in the preparation of which the greatest care was always

taken to secure its perfect purity and uniformity of strength, made its way all over the country, because it was convenient and economical, and afforded a pure flavoured result very different to the varying samples of the more legitimate "distilled vinegar" of the Pharmacopœia; and I very well recollect in my early days it was used somewhat clandestinely in all preparations in which distilled vinegar was ordered. Thus it is clear that the strength of distilled vinegar was generally understood to contain about three per cent. of real acid. When, however, the Pharmacopœia of 1824 made its appearance with its acid of 30·8, continued through those of 1836 and 1851, chemists and druggists seem generally to have overlooked the fact that it was much stronger than the acid called one to seven; that the proportions for mixing it were very different, and the resulting mixture much stronger than what they had been in the habit of using. Simple oxymel prepared by the old and new methods were two different things; Acetum Cantharidis could not be prepared with the acid called one to seven, a thick unpleasant compound was always the result; and I have strong reason to believe that a stronger acid than that ordered in the Pharmacopœia, and without any reference to a definite strength, is commonly used for this preparation, which consequently renders it quite empirical. I must myself plead guilty to this ignorance until it became my duty to take an active part in going over the Materia Medica with a view to the preparation of a new Pharmacopœia. Much pains were taken by the committee formed for this purpose, and a very careful list of every article of materia medica found in the three Pharmacopœias was made out, Mr. Squire's book of the three Pharmacopœias being the basis of it; and the inconsistency and diversity of the preparations of acetic acid were forced upon the committee. I then made all the preparations of acetic acid with the acids of different strengths, namely, P. L. of 30·8 per cent. and diluted 4·6 per cent.; Beaufoy's, one to seven, of 24·25 per cent. diluted three per cent.; and with the exception of Acetum Cantharidis, which cannot be well made with a weaker acid than 30·8, those made with the weaker acid were decidedly preferable, being quite acid enough for all useful purposes, and not inconveniently so to the palate. After this I paid a visit to Messrs. Beaufoy and Co., where every information I required was most politely and courteously afforded me. I found three strengths of acetic acid kept and sold by them to druggists and surgeons, namely,

1st, that labelled 1 acid to 11 water.
2nd, " 1 " 9 "
3rd, " 1 " 7 "

Those marked 1 to 11 and 1 to 7 are usually and almost exclusively sold to druggists and surgeons,—the last being generally but erroneously supposed to be the Acidum Aceticum of the London Pharmacopœia, and used as such, but in fact corresponding to the Acidum Aceticum of commerce of the Dublin Pharmacopœia, and when diluted as directed on the label attached thereto affording an acid of only 3·5 per cent.; the first corresponding with Acidum Aceticum Forte of the Dublin Pharmacopœia. The other, marked 1 to 9, is the Acidum Aceticum of the London College, and should be marked as the College orders, 15 parts by weight of acid to 85 water = 3 to 17, or 1 to $5\frac{2}{3}$, or 23 fl. dr. in 20 fl. oz., to afford a diluted acid containing 4·6 per cent of real acid. This last-named acid (30·8 per cent) is not generally known in the retail trade; consequently for the last 30 years nearly we have mostly been in error in our pharmaceutical practice. I found there were technical trade difficulties in the way of altering labels and bringing the subject prominently forward before the pharmaceutical public. Mr. Beaufoy had not lost sight of the fact of difference in strength, although the druggists had, and he had labels prepared for the new acid, but never used them. At my urgent request however, that they would clearly distinguish

the true Pharmacopœia acid, they adopted the following label in *blue ink*, which is sufficiently explicit.

TO MAKE THE

ACIDUM ACETICUM DILUTUM

OF THE

PHARMACOP. LONDIN. 1851,

TAKE OF

THIS ACID BY WEIGHT......... 15 PARTS.
DISTILLED WATER BY WEIGHT 85 PARTS.

The following are memoranda of the results of a very careful analysis I made of the three acids just named. The experiments were repeated twice or three times, and confirmed by my friend and colleague in the Pharmacopœia work, Dr. Redwood. The specific gravities were taken in 1000-grain bottle, and the estimation of the acid was made with carbonate of baryta.

Beaufoy's Acetic Acid. *	Contains of Anhydrous Acid per cent. *	To make the Acid. Acet. Dil. of the P.L. = 4·6 per cent., use of Acid to Water.	To make the Acet. Acid. Dil. of the P.E. = 3· per cent., use of Acid to Water.	To make the Acet. Acid. Dil. of the D.P. = 3·5 per cent., use of Acid to Water.
1 to 7 sp. gr. 1040·5	24·25	1 in 5·27	1 in 8·08	1 in 6·93
1 to 9 „ 1047·5	30·02	1 in 6·52	1 in 10·00	1 in 8·57
1 to 11 „ 1056·0	41·00	1 in 8·91	1 in 13·66	1 in 11·71

The Acid. Acet. Dil. of the P. L. 1824, contained of anhydrous acid 4·6 per cent.
The Acet. Destill. of the P. L. 1836, contained of anhydrous acid 4·6 per cent.
The Acid. Acet. Dil. of the P. L. 1851, contains of anhydrous acid 4·6 per cent.
The Acidum Aceticum of the same Pharmacopœia contained of anhydrous acid 30·8 per cent.

By which it appears that there has been no alteration in the strength of the preparation for nearly forty years.

The present formula for Acid. Acet. Dilut. is acetic acid = 30·8 per cent., 23 drs. *fluid*, distilled water to fill 20 fl. oz. = 160 fl. drs. = 1 in 6·956, or in round numbers 1 *in* 7, and not 15 to 85 = 3 to 17 = 1 to 5·66, unless the latter proportions be very carefully made by *weight*. (*Vide* Phillips's Translation of the Pharmacopœia, London, 1851, page 50.)

If the foregoing statement be correct, it will appear that to make the Acid. Acetic. Dil. of the present London Pharmacopœia = 4·6 per cent. of anhydrous acid, the following should be the strength of the acids marked respectively 1 to 7, 1 to 9, and 1 to 11, namely:—

1 to 7	should be 36·81	instead of	24·25.
1 to 9	„ 46·04	„	30·02.
1 to 11	„ 51·21	„	41·0.

I suppose the new forthcoming National Pharmacopœia will help us out of this great difficulty, otherwise the first step towards it would be for the manufacturer to send out the acid of the London Pharmacopœia with this simple label:—

* These numbers so nearly agree with the following, given to me by Beaufoy and Co., that practically there is no difference:—

1 to 7 . . .	1040· . . .	24·25
1 to 9 . . .	1048· . . .	30·08
1 to 11 . . .	1056· . . .	41·00

ACIDUM ACETICUM, P. L.,
Contains of real Acid 30·8 per cent.

For although the acid marked 1 to 9 corresponds very nearly with it, none of the directions for diluting this or the other acids sent out with them, would yield a product corresponding with the Acid. Acet. Dil. of the P. L.

In thus endeavouring to throw a little light on this anomalous subject, I feel I have not done it justice or gone so fully into it as I might have done. It may however serve to show that however correct our business instinct may be, and however warrantably we may rely on the manufacturer for the strength and purity of his commodities, we are not justified in failing to study the Materia Medica and Pharmacopœia for ourselves, and working them out in their integrity to the best of our ability. At the present day so much progress has been made in general knowledge and in scientific acquirements, and the thirst for more has become so general, that there is less fear of the forthcoming National Pharmacopœia being as much neglected by the mass of chemists and druggists throughout the country as there was even so short a time back as 1851. Besides, we shall have but one rule of action instead of three to go by, and all such anomalies will be removed.

In naming Messrs. Beaufoy and Co., I wish it to be particularly understood that I cast no reflection on them; the fault is our own, for we are greatly indebted to them as the great pioneers in the preparation of pure acetic acid for pharmaceutical purposes from the destructive distillation of wood.

The PRESIDENT thought the Society was indebted to Mr. Deane for the great pains he had taken in explaining this subject, which had hitherto been imperfectly understood by many pharmaceutists, and had occupied a great deal of the time of the Pharmacopœia Committee in endeavouring to make it more intelligible.

Mr. SQUIRE could bear his testimony to the diligence which had been exercised by Mr. Deane in working out this subject while on the Pharmacopœia Committee. He hoped that in the new British Pharmacopœia the anomalies which had hitherto existed with reference to the acetic acids ordered in medicine would be removed.

UPON THE ADMINISTRATION OF BISMUTH IN THE SOLUBLE FORM.

BY CHARLES R. C. TICHBORNE, F.C.S.

Under the name of Liq. Bismuthi there has been introduced to the notice of the Faculty a preparation, which purports to possess great advantages over the ordinary basic nitrate. The desirable points in this preparation are—first, its solubility; second, its slight taste; and third, its alkalinity. It has also the peculiarity of not being precipitable by water.

I felt the desirability of such a mode of exhibiting bismuth, and therefore made an analysis of the solution for my own information; and as it possesses certain phases of interest, I now take this opportunity of placing it before the members of the Pharmaceutical Society.

A qualitative analysis elicited the following:—The solution contained bismuth, citric acid, and ammonia; not a trace of nitric acid could be detected in the solution. Liq. Bismuthi is therefore probably a solution of a basic salt, having a composition analogous to $3 MO Ci + MO$; one of the bases, MO, being replaced by BiO_3: it is made from the recently precipitated and well-washed oxide. From the peculiarity of having to deal with an alkaline bismuthic solution, direct pre-

cipitation with sulphide of ammonium was employed to determine the amount of bismuth present; this gave, on washing and drying, 0·327 grammes of $Bi S_3$ in the fluid half-ounce, which represents 1·114 grains of the teroxide as being present in the drachm. Now, although the circular which accompanies the Liq. Bismuthi states that ʒj is equivalent to a full dose (fifteen to twenty grains) of the insoluble trisnitrate, I do not think such can be the case. The idea evidently is that the metal, when in the soluble form, is much more active than the ordinary insoluble modification, and there can be no doubt that it is so to a certain extent; but I should consider three grains to the drachm as the minimum dose: even more than this quantity may be easily introduced into such a solution as the above. The following is probably the mode pursued in making this solution:—430 grains of metallic bismuth are dissolved in a sufficient quantity of nitric acid, and this solution of ternitrate of bismuth is then precipitated with ammonia, and the resulting hydrated oxide well washed; 480 grains of citric acid are then exactly neutralized with ammonia, and the moist oxide is gradually added to the boiling solution of citrate of ammonia. The oxide is slowly but perfectly taken up. Ammonia is slightly evolved during the boiling, (probably from the decomposition of the citrate of ammonia *per se*,) but the solution becomes slightly acid, and remains so until the completion of the process. The solution is then neutralized with ammonia, and the whole is made to measure one pint. This solution will contain three grains of $Bi O_3$ to the ʒj. It is more elegantly made by dissolving the citrate of bismuth in citrate of ammonia.*

Tartaric acid has also a similar action upon bismuth.

There seems to be a limit to the solubility of chemically pure citrate of bismuth; but the solubility is wonderfully increased by the presence of mineral acids. This is, no doubt, due to the greater solubility of the salts formed by the latter acids in citrate of ammonia.

The reactions of this bismuthic solution are as follows:—

Ammonia and carbonate of ammonia give no precipitate. Potash and soda, or the carbonates of these alkalies, give precipitates insoluble in an excess of the precipitant. Nitric, sulphuric, and hydrochloric acids give precipitates soluble in an excess of the respective acids, and reprecipitable on neutralization with ammonia. These precipitates are also soluble on the further addition of ammonia. Water gives no precipitate. Sulphide of ammonium throws down the whole of the bismuth as sulphide.

As the reactions of citric and tartaric acids are at present little known, it is my intention to investigate the matter further, particularly with a view to its analytical bearing; but in the meantime, I place before you the results of my investigation of the Liq. Bismuthi.

Mr. SCHACHT (of Clifton) said that although the author of the paper had not thought fit to mention his name in connection with the liquor bismuthi examined, there could be no doubt, from the quotation made from the circular, that the preparation the meeting had just heard so freely discussed was that made by himself. Assuming this to be the case, he could state that the author had well performed his task in submitting it to analysis. The preparation, sold as liquor bismuthi (Schacht), consisted of bismuth oxide, citric acid, and ammonia, and the quantity of oxide of bismuth present was one grain in each fluid drachm. This, however, had been published in the 'Lancet' several months ago. A fact so easy of investigation he had never attempted to keep secret, but, on the contrary, he had told its composition to every medical man with whom he had conversed on the subject. He had adopted the name "Liquor Bismuthi (Schacht),"

* Citrate of bismuth is a very insoluble salt, got by the double decomposition of citrate of potash or soda, and ternitrate of bismuth. The citrate, as made in this manner, is extremely soluble in ammonia, or a solution of citrate of ammonia.

partly because having been fortunate several years ago in discovering this elegant method of holding bismuth in permanent solution, he was anxious to reap some measure of reward in the credit which would attach to so distinct an improvement as he believed this preparation to be; and partly also because, as the article can only exist in the form of solution, it was convenient that the profession should be invited to prescribe a medicine of one definite strength. In answer to the author's suggestion that it should be made three times as strong as he (Mr. Schacht) had been accustomed to make it, he would observe that the quantity indicated as a dose—one drachm—was easy both to remember and to dispense, and he had abundance of evidence to prove that in such doses it was efficient, in many cases succeeding where full doses of from five to twenty grains of the trisnitrate had failed. He claimed the credit, such as it was, of having been the first to prepare and introduce to the profession a permanently fluid form of bismuth; and as his preparation had been a good deal employed during the last five or six years, it would be a great pity to alter its strength.

Dr. Attfield said that the fact of the solubility of oxide of bismuth in citrate of ammonia had been observed by Mr. Spiller more than five years ago, and published, together with other observations relating to the influence of citric acid on chemical reactions, in the Journal of the Chemical Society. To Mr. Schacht, however, was no doubt due the practical application of this fact, and the production of what was apparently an excellent form of medicine for the administration of bismuth.

Mr. Squire asked Mr. Schacht if any experiments had been made by medical men to determine the relative strengths and values of his preparation and the subnitrate.

Mr. Schacht said several cases had been reported to him by Dr. Martin, the senior physician to the Bristol Hospital, and other medical men, in which benefit had resulted from the use of his preparation where the old insoluble form of subnitrate had either failed or proved less efficacious, but he could not at the moment refer to any experiments made with the special object of determining the relative strengths of the two medicines.

Mr. Haselden was glad to see Mr. Schacht present to speak for himself. He (Mr. Haselden) had frequently used his liquor bismuthi, and thought it a very elegant preparation. Some persons, on hastily reading the circular that was issued with it, might perhaps have concluded that each fluid drachm contained more than a grain of the oxide of bismuth, as it purported to represent fifteen or twenty grains of the subnitrate, but it was evident from Mr. Schacht's explanation that this soluble form of bismuth was much more active than the old insoluble form, and hence the much smaller dose proved equally, if not more, efficacious.

Dr. Redwood was anxious to say a word or two with reference to the name Mr. Schacht had given to his preparation. Now that the composition of liquor bismuthi was no longer a secret, he thought it very desirable that a name should be given to it indicating what its composition was. He thought the practice of introducing new medicines under names that afforded no indication, or a very imperfect indication, of what they were, was much to be regretted. Such a practice often caused much inconvenience and difficulty to pharmaceutists in dispensing, and also deprived medical men of the means of ascribing the effects of such medicines to their true causes. He should be glad to know from Mr. Schacht whether he had formed any opinion as to the constitution of the compound of bismuth contained in his liquor bismuthi, and whether he had observed, as stated by Mr. Tichbourne, that ammonia was evolved when the oxide of bismuth was dissolved in the neutral citrate of ammonia. He knew that Mr. Schacht was not unaccustomed to speculations and investigations relating to the constitution of salts.

Mr. SCHACHT remarked that his process not being the same as that described by Mr. Tichbourne, he had not had an opportunity of observing the effect referred to on dissolving the oxide in citrate of ammonia. He had however found it desirable to add a little excess of ammonia so as to make the solution alkaline. He had no theory to suggest with reference to the constitution of the salt of bismuth present in the solution.

The PRESIDENT expressed the thanks of the meeting to the author of the paper for his communication, and to Mr. Schacht for the information he had given respecting his very elegant and efficient preparation of bismuth. He quite agreed, however, with Dr. Redwood, that the names given to medicines should, as far as possible, represent their composition.

DONATIONS AND SUBSCRIPTIONS RECEIVED FOR THE BENEVOLENT FUND DURING 1863.

DONATIONS.

	£	s.	d.
Moscrop, Edward H., 140, Strand	100	0	0
Waugh, George, 177, Regent Street	25	0	0
Cocher, Thomas A.	1	1	0
Floyd, James	1	1	0
Smith, Clarke	1	1	0

SUBSCRIPTIONS.

	£	s.	d.
Ainslie, Wm., Edinburgh	0	5	0
Aitken, William, Edinburgh	0	5	0
Allchin, Alfred, Richmond Road, Barnsbury	0	5	0
Arnold, Edward, Norwich	0	5	0
Attwood and Hugill, Messrs., 61, Cannon Street	1	1	0
Balmer, John, 94, St. John's Rd.	1	1	0
Barnard, John, 338, Oxford St.	0	10	6
Barnes, Jas. B., 1, Trevor Terrace	0	10	6
Baynes, James, Hull	0	5	0
Bird, William L., 42, Castle St.	0	10	6
Bishop, Alfred, 17, Speck's Fields	2	2	0
Bishop, Thomas, Woolwich	0	10	6
Blake, Sandford, and Blake, 47, Piccadilly	1	1	0
Blanshard, George, Edinburgh	1	1	0
Bolton, Thos., Tenterden	0	5	0
Bond, John, Yarmouth	0	5	0
Bottle, Alexander, Dover	1	1	0
Bourdas, Isaiah, 10, Pont Street	1	1	0
Boyce, John, Chertsey	0	5	0
Bradley, John, 21, Belgrave Rd.	0	10	6
Brailey, Charles, Heavitree	0	5	0
Breton, Walter, Brighton	0	10	6
Brown, Edward, Leeds	0	10	6
Brown, Wm. S., Manchester	1	1	0
Buckle, C. F., Gray's Inn Road	0	5	0
Butcher, Thomas, Cheltenham	0	5	0
Butler, Samuel, Bristol	0	10	0
Carmichael, L., Edinburgh	0	5	0
Cartwright, Wm., Newcastle-under-Lyne	0	10	6
Christopher, Wm., Crickhowell	0	5	0
Cocksedge, H.B., 20, Bucklersbury	0	5	0
Coles, J., Camberwell New Road	0	10	6
Cooper, George, Exeter	0	5	0
Cupiss, Francis, Diss	0	10	6
Davies, Charles, Brixton	0	5	0
Davies, H. E., 43, Wood St., City	0	10	6
Deane, Henry, Clapham	1	1	0
Davenport, John T., 33, Great Russell Street	2	2	0
Duffin, Thomas, Huddersfield	0	10	6
Eddy, Charles William, 30, Crown Street, Finsbury	1	1	0
Edwards, William, Hastings	0	5	0
Farrow, William, Woburn	0	5	0
Faulconer, Robt., Keen's Row, Walworth	1	1	0
Fenn, John T., 83, Regent Street, Westminster	0	5	0
Fletcher, Francis, Cheltenham	0	5	0
Fox, William, 48, Church Street, Bethnal Green	0	10	6
Gale, Samuel, 338, Oxford Street	0	10	6
Gardener, Ch., Tunbridge Wells	0	5	0
Gardner, James, Edinburgh	0	5	0
Garle, John, Bromley, Kent	1	1	0
Gedge, W. S., St. John Street	0	5	0
Glass, John T., Cheltenham	0	5	0
Goodbarne, Thos., 13, Charles Street, Hoxton	0	10	0
Goodwin, John, Lower Clapton	0	10	6
Gristock, Thomas, 42, South St., Manchester Square	0	10	6

	£	s.	d.
Gwatkin, John T., Brighton......	0	10	6
Harvey and Reynolds, Leeds......	1	1	0
Harris, W. H., Northampton......	0	10	6
Haselden and Fisher, 18, Conduit Street	1	1	0
Herring and Co., 40, Aldersgate Street............................	1	1	0
Hills, Thos. H., 338, Oxford St.	1	1	0
Hodder, Henry, Bristol...	0	5	0
Hollier, Elliott, Dudley............	0	10	6
Holman and Ham, Exeter	0	10	0
Hooper, Bartlett, 43, King William Street	0	10	6
Howell, Thomas, Camden Town	0	10	0
Howell, Maurice, Peckham	0	5	0
Hurst, Wm. J. H., Gloucester ...	0	5	0
Husband, Matthew, Exeter	0	5	0
Hustwick, Thomas H., Hereford	0	5	0
Jackson, Thomas, Manchester ...	0	10	6
Johnson, Benjamin M., 70, Tottenham Court Road	0	5	0
Kent, T., 226, Blackfriars Road	0	10	6
Kernot, George Chas., Poplar ...	0	10	0
Leadbetter, W., Melton Mowbray	0	5	0
Linsley, Thomas, York	0	5	0
May, John, Battersea	0	10	6
Manifold, John J., Weaverham	0	10	0
Middleton, Francis, 338, Oxford Street	0	10	6
Moore, Jas. L., 1 Craven Street...	0	10	6
Morton, Henry, Ramsgate..... ...	0	5	0
Musson, T. G., Birmingham ...	0	10	6
Negus, Samuel, Northampton ...	0	10	0
Nind, George, Wandsworth	0	10	6
Nichol, Anthony, Newcastle-on-Tyne	2	2	0
Noakes, Richard, Brighton	0	10	6
Orridge, Benjamin M., 30, Bucklersbury	1	0	0
Parsons, William, Portsmouth...	0	10	0
Palk, John, Exeter	0	5	0
Palmer, Faithful, Cheltenham ...	0	5	0
Parkes, John C., Woolwich	0	10	6
Penrose, Arthur W., 7, Amwell Street	0	5	0
Picnot, Charles, Strood............	1	1	0
Pocklington, James, Sydenham	0	10	6

	£	s.	d.
Pollock, T., 129, Fenchurch St.	1	1	0
Poulton, John, Newton Abbot	0	10	6
Powell, John, Shaftesbury	0	10	6
Pratt, John, Chichester	0	10	6
Prior, George T., Oxford	0	10	0
Prockter, Richd. E., Cheltenham	0	5	0
Proctor, W., Newcastle-on-Tyne	1	1	0
Randall and Son, Southampton	1	1	0
Rankin, Wm., Kilmarnock	1	1	0
Rastrick, Joseph L., Southsea ...	0	5	0
Rea, Edward, 115, Wardour St.	1	1	0
Redfern, Jn., Ashby-de-la-Zouch	1	1	0
Roberts, Albinus, St. Alban's ...	1	0	0
Robinson, James M., Beverley ...	0	5	0
Rogerson, Michael, Bradford, Yorkshire	2	2	0
Russell, C. J. L., Windsor.........	0	10	0
Savage, Wm. D., Brighton	0	10	6
Sagar, Henry, Leeds...............	0	5	0
Stott, Wm., Sowerby Bridge ...	0	5	0
Shirley, John G., Bayswater ...	0	10	6
Sims, John F., Barnsbury.........	0	5	0
Southall, Son, and Dymond, Birmingham	1	1	0
Spencer, Charles, Gravesend......	1	1	0
Starkie, James, 4, Strand	1	1	0
Smith, John, Southampton	0	10	6
Smith, Nathaniel, Cheltenham...	0	5	0
Smith, Wm. F., 12, Keen's Row	0	10	6
Squire, Peter, 277, Oxford Street	1	1	0
Street, Edward, Cheltenham ...	0	5	0
Strawson, Henry, Crewkerne ...	0	10	6
Stathers, John, 43, Norland Road	0	10	6
Stone, John, Exeter	0	5	0
Tanner, Nicholas W., Exeter ...	0	5	0
Thomas, John A., Harrogate ...	0	5	0
Thomas, John J., Stoke Newington	0	10	0
Thomas, James, Bridge............	0	5	0
Tucker, Charles, Bridport.........	0	10	6
Waite, Joseph, Cheltenham	0	5	0
Warner, Charles H., Fore Street	1	1	0
Watkinson, Thomas, Cinderford	0	2	6
White, Daniel, Park Terrace, Regent's Park.....................	1	1	0
Young, George, Millwall	0	5	0

BENEVOLENT FUND ACCOUNT FOR THE YEAR 1863.

	£	s.	d.	£	s.	d.
Subscriptions	78	18	6			
Donations	128	3	0			
				207	1	6
Dividends				169	2	11
				376	4	5

	£	s.	d.
Grants to two aged Widows ,, to two distressed Members.....................	90	0	0
Purchase of £307. 11*s*. 3*d*. Cons.	286	4	5
	376	4	5

Invested in Consols, 31 Dec., 1862	£5,875	8	7			
Purchase of Consols as above	307	11	3			
				6,182	19	10

PROVINCIAL TRANSACTIONS.

LEEDS CHEMISTS' ASSOCIATION.

The Third Ordinary Meeting of the Association for the session, was held at the School of Art on Wednesday evening, December 9, 1863; the President, Mr. Harvey, in the chair.

Mr. W. H. Bell, of York, was elected an Ordinary Member.

The Library Committee reported the following donations to the Library during the past month, viz.—Mr. Smeeton, £1; Mr. Backhouse, 10*s.*; Mr. Kettlewell, 10*s.*; Mr. Stead, 10*s.*; Mr. B. Taylor, 10*s.*; Mr. Walker, 10*s.*; Messrs. Clarke, Bleasdale, Bell, and Co. (York), 'Miller's Elements of Chemistry,' in 3 vols., complete.

The best thanks of the Association were awarded to the donors.

The Committee had arranged that the occasion should serve the double purpose of being an ordinary monthly meeting of the Society, whilst it was also selected for the delivery, by Mr. Edward Thompson, of the introductory lecture of a course on Materia Medica, which he will continue upon each succeeding Monday evening.

Mr. Thompson commenced by observing that as he had been requested to give his Introductory Lecture at an ordinary monthly meeting of the Association, he should think that it would be hardly respectful to the experienced druggists present, to take up much time with mere elementary matter, and should therefore branch out into topics of a general character, upon which he might not otherwise have touched, and which might be considered as somewhat remotely connected with Materia Medica. And to begin at some distance from the subject in hand, he should venture to make a few observations on certain points relating to the present position of the Chemist and Druggist of this country. If his remarks should provoke a little temperate discussion at the end, he should not regret it, as truth might thus be elicited, which was his only object.

He would therefore just glance at the position of the druggist in relation to—1st, the Law; 2nd, the Medical Profession; and 3rd, the Pharmaceutical Society. And he would observe that such questions as were now proposed to be briefly discussed were interesting to the student, as well as to the man in business, because the former, as well as the latter, should have correct information about his position, and his relation to other classes of persons.

1. *The Law.*—At present chemists and druggists were not recognized or protected by the law, any more than were other shopkeepers. It had been proposed that chemists should have certain privileges, and especially that they should have the exclusive right to sell drugs. Now this question would be viewed differently by different persons. Druggists themselves might naturally incline to the opinion that a monopoly of the business should be established, and that all others should be prevented from meddling with it, and much might be said in favour of this view. It might be urged that none but persons of some education, and who had been brought up to the habits of attention and sense of responsibility which characterize the respectable chemist and druggist, could sell potent drugs with safety to the public; and in particular, that all poisonous substances should be retailed only by such persons, and that such a regulation would be the best "Poison Bill" that could be enacted.

Strong as these arguments were, he was of opinion that the Legislature was not at all likely to be influenced by them. For, in the first place, the tendency of modern legislation was decidedly against monopolies, and in favour of free-trade. Some professions, it was true, were still allowed to have exclusive privileges; that of law, for instance, but monopolies, formerly so numerous, had gradually been reduced to a very small number.

If we wanted to know how the Legislature would probably treat any proposal for giving exclusive privileges to the druggist, we might obtain valuable information by observing how they had deliberately acted in a similar case. The course of modern legislation on the medical profession was strictly in point. Before 1815 the members of that profession, at least in the country, had no exclusive privileges. In that year it was enacted that no one should act as an apothecary in England unless he had a licence from the Apothecaries' Company of London, the business of a chemist and druggist still retaining all the rights that it previously possessed. Such continued to be the state of

things for more than forty years. Occasionally during these years the Apothecaries' Company prosecuted some illegal practitioner; but in general the law was not enforced Sometimes an unlucky physician or surgeon, highly educated, but who had not been so fortunate as to seek the licence of the Company, was fixed upon for prosecution, while notorious quacks were quietly allowed to accumulate their gains, to the great scandal of the profession. At last the Apothecaries' Company entirely ceased to perform the thankless office of prosecutor for the profession, and again every one did that which was right in his own eyes. Great was the cry for medical reform, and much need there was for it. For some time all was confusion, some demanding one kind of reform and some another. At last the profession became more unanimous. All expected that exclusive privileges would be conceded. But when the matter came to be discussed in Parliament, it was found that the Lords and Commons, who sympathized with the public rather than with any professional section of it, were in no mood to grant any more monopolies. They left the Apothecaries' Act where it was, a dead letter, and passed a new law, framed on a new principle, which was, to certify to the public who were properly qualified practitioners, and then leave every one at liberty to employ whom he would; with this proviso, that the Government itself in its vaccination, poor-law, sanitary, or medico-legal departments, should employ none but those who were registered as well qualified medical men. When it was added that the Act appointed a Council for the regulation of medical education, and the publication of a Pharmacopœia, and provided for the speedy punishment of all who should untruthfully give themselves out to the public as legally registered practitioners, we became acquainted with the whole spirit of the last example of legislation in a department bearing the strictest analogy to our own.

From this illustrative case then, what could we learn as to the probable future legislation for chemists and druggists? This, that Government might devise some system of registering all who were qualified to conduct the business with safety to the public, and might give to such persons a title by which the public might judge of the qualifications of its holders, preventing, at the same time, unqualified persons from assuming the title. And as the people of this country in the exercise of their vaunted liberty appeared to cherish the right to consult ignorant pretenders to the art of healing, so they might wish to preserve the privilege of obtaining their drugs of those who knew nothing of their properties, and the Legislature would probably allow them to continue to enjoy their liberty.

But the Legislature would have to distinguish between the qualified and the unqualified by an examination. If so, it behoved young men, both as they would desire to conduct their own business with respectability, and as they would wish to pass such an examination with credit, to prepare for the future by diligently availing themselves of this and all other opportunities of becoming acquainted with Materia Medica.

Two conclusions were then arrived at:—1st, that examinations, which were now optional and honorary, would probably at no distant period be so far compulsory that no one could attain a respectable position in the business without passing them; and, 2ndly, that such examinations should be diligently prepared for.

2. *The Medical Profession.*—After remarking on the necessity of a knowledge of materia medica and posology for the compounder of prescriptions, connected, as such work was, with the restoration of health and the preservation of life, he (Mr. Thompson) proceeded to observe that there was another view of the relation between the druggist and the practice of physic, which could hardly be left unnoticed on that occasion, namely, what was called *counter-prescribing.* One-sided views had often been taken on this subject. Sometimes a surgeon wrote to the 'Lancet,' denouncing some neighbouring druggist who deprived him of patients, without stating at the same time that he himself was keeping an open shop, poaching upon the domain of the druggist, and throwing down those external distinctions by means of which the public might judge between the surgeon and the druggist. Sometimes a London Pharmaceutical Chemist, whose business consisted in preparing medicines according to the prescriptions of physicians, told us in the 'Pharmaceutical Journal' how very improper it was for any druggist to act both as prescriber and dispenser, and how carefully all articles bearing upon the action of drugs in the cure of disease should be excluded from the Journal. Other druggists, living in country towns where there were no hospitals, and where medical advice could not be cheaply purchased, thought themselves compelled, by the necessities of their position and the constant demands of their customers, to exercise what little knowledge of medicine they possessed, and consequently prescribed in slight cases—sometimes, indeed, undertaking to

cure more dangerous diseases, and perhaps wasting the patient's time by giving him inefficient remedies, when time to him was a matter of life and death.

He (the lecturer) believed that all these one-sided opinions had something right and something wrong in them. How much of each might perhaps be ascertained if we could answer two questions, which ought always to be kept distinct:—1st. How much counter-prescribing *could* a druggist do, according to law? and 2nd, how much *ought* he to do as a question of right and conscience?

(1.) Provided a man called himself a druggist, and not a medical practitioner, the law, irrespective of the Apothecaries Act of 1815, allowed him to do almost any amount of prescribing he liked, either in-doors or out-of-doors. But he (Mr. Thompson) contended that the law was not to be regarded merely as to what it directly *prevented*. The law held a druggist accountable for the *consequences* of medical practice to a much greater degree than a legally-qualified surgeon was. For whereas a surgeon was supposed by the law to be competent as far as regarded knowledge for the exercise of his profession, a druggist, as such, was supposed to be incompetent. The one was answerable for wilful neglect only, the other for ignorance also. Thus, though the law did little or nothing *directly* to prevent counter-practice, it might do much towards this end *indirectly*, by making every one ignorant of the science of medicine, and of the structure of the human body, responsible for the evil consequences of his *ignorance*.

(2.) As to the question, how much of counter-practice *ought* a druggist to do, in an ethical sense? Perhaps in ninety-nine cases in a hundred it would be best to answer,—"Send the patient to a doctor." One thing the druggist must *not* do, he must not prescribe for a case *ignorantly;* that is, whenever he uses powerful drugs, or takes up the time of a patient by recommending those of a milder character, he ought to be conscious that he has as much knowledge of the case before him as an educated medical practitioner is likely to possess. He should act as he would do if a watch were brought to him that would not keep time. He would confess his ignorance of its structure—he would not pull it in pieces, lest he should not be able to put it together again; and, in general, he would return it to its owner with a recommendation to send it to a watchmaker. But supposing that the only fault of the watch was that it went too slow, the druggist might know enough about a watch to be aware how to move the regulator to one side or the other. In this simple case he might do as well as the best watchmaker. Whether, therefore, he sent the watch away, or remedied its defect, he would act up to the real knowledge he possessed, and no further. So he ought to do in the practice of physic, if he be required to act at all. Division of labour, however, was generally found to be best for all parties concerned.

3. *The Pharmaceutical Society.*—As regarded the position of this Society towards the chemists of Britain, the lecturer thought that it was right and proper that one Society, having its head-quarters in London, should have the confidence of all respectable druggists, who should be induced, in some way or other, to unite themselves with it. The Pharmaceutical Society, he thought, as being the first in the field, as having already been chartered and recognized by the Legislature, and as having done some good work towards the elevation, and in defence of the trade, had pre-eminent claims to hold the position indicated. It was evident, however, that some changes must be effected before the Pharmaceutical Society could be considered to represent the whole body of druggists. Without attempting to exhaust the subject, he would suggest that the examination should be greatly modified. Let there be two kinds of examination: one, intended to distinguish those who had made considerable progress in the sciences upon which the business was based; the other, meant to point out to the public all who were qualified to conduct their business with safety and respectability. One examination would be rather more severe than the present Major,—the other much milder than the present Minor. If the fees were sufficiently low, as they might be if the number of members were proportionally increased, and the public could understand that the holders of the Society's certificate were alone to be trusted with the responsible duty of compounding prescriptions, much might be done towards setting up the Pharmaceutical Society as the head of the business of a chemist and druggist in England, and some progress would be made towards giving to well-qualified druggists the only monopoly they were likely to get in this country.

Having thus disposed of some questions but remotely connected with Materia Medica, the lecturer proceeded to approach more nearly the subject in hand. He stated that

Materia Medica was not a science by itself, but was made up of selections from other sciences, such as chemistry, botany, mineralogy, zoology, and therapeutics. It must be remembered, he said, that the primary object of this course differed from that of the course under the same title delivered in a medical school. When lectures on Materia Medica were addressed to *medical* students, it was very important to show how drugs acted on the healthy system, or how they operated in controlling disease; whereas with the *druggist* these were secondary, though not altogether unimportant matters. His object is to be able to judge of the quality of drugs, and the mode in which they should be compounded, so as to present them in the most efficient form for the use of the medical practitioner. Without paying much attention to therapeutics, it would be found that Materia Medica embraced a large field. Each substance had to be considered in regard to its *past*, its *present*, and its *future*. Its past origin, how prepared or where grown;—its present properties, characteristics, possible impurities, varieties, commercial value, place in nature, and affinities with other bodies;—its future uses, effects and dose.

After canvassing the merits of the therapeutic arrangement of the Materia Medica, the lecturer stated his preference for the method founded on natural history, for his present purpose, and concluded by pointing out the advantages of instruction by means of lectures, and offering some advice to the students respecting the best way of profiting by it.

The President expressed the obligations of the members present to Mr. Thompson, for the highly-interesting paper to which they had listened. He had treated with great ability, and in a clear and lucid manner, some questions of pharmaceutical politics which had great interest for each of them. It was a valuable service thus to review their rights, and also their duties, in relation to various bodies of the community, and he hoped that the members would have the opportunity of still more thoroughly reflecting upon the sound and sagacious ideas propounded, by the publication of a full report of the paper.

NOTTINGHAM CHEMISTS' ASSOCIATION.

The Third General Meeting of this Society was held on Tuesday evening, the 24th ultimo, at the Town Hall; Dr. Tatham in the chair.

The minutes of the last meeting were read and confirmed, and donations to the library announced, after which Mr. S. Parr read a very interesting paper on "Disinfectants." Mr. Parr observed that the limits of a single paper would not permit him to give a detailed account of all the disinfectants known at present to the chemist; he therefore alluded very briefly to some, while the more important were considered more in detail.

After the reading of the paper, a discussion on the subject of disinfectants took place, in which Dr. Charles Taylor, Mr. Atherton, and Mr. T. A. Stephenson took part. A vote of thanks to Mr. Parr, for his paper, was proposed by Dr. Tatham, and carried with acclamation.

Mr. J. H. Atherton, in the course of a few remarks, stated that the Society had been singularly unfortunate in their efforts to provide lectures for the associates. Dr. Wilson had been consulted with a view to the admission at a reduced rate of associates of the Society to his lectures on Chemistry. But the committee resolved that the dignity of the Society would be better upheld by the appointment of a lecturer. Accordingly, arrangements had been made with a gentleman in the town, of high reputation, for the delivery of a course of lectures on Materia Medica. The lectures would be very complete and adapted to the every-day requirements of the chemist, and would qualify those who were desirous of passing the Minor examination of the Pharmaceutical Society. Mr. A. also stated that arrangements had been made with the Chamber Committee for the hire of two very good rooms in the Exchange buildings. The rent was moderate, and within the means of the Society; one room to be used as a lecture room, and the other as a library and reading-room. This room would be comfortably lighted, heated, and furnished, and be open from eight until half-past ten every night, except Saturday. The leading scientific periodicals of the day would be laid on the table each evening. The committee earnestly hoped that the members and associates of the Society would support their efforts to raise the educational standard of the trade.

The Secretary proposed a vote of thanks to the Chairman, which was seconded by Mr. E. J. Lowe, and adopted, after which the proceedings terminated.

The Fourth General Meeting of this Society was held in the Grand Jury Room, Town Hall, on Tuesday evening, the 15th inst.; Mr. S. PARR, President, in the chair.

The minutes of the preceding meeting were read and confirmed.

The PRESIDENT announced that the course of lectures on Materia Medica, by Dr. Brookhouse, would commence early in January. He should have great pleasure in offering a prize of books to the student who paid the most attention; Mr. Parker, of Radford, would also present a prize to the second best. The President then said that the paper which would be read that evening by Dr. Charles Taylor, on the Diseases of the Eye, would be illustrated by diagrams, and by the Ghost Ophthalmoscope. This apparatus was one of the modern appliances of physical science for demonstrating the beautiful structure of the human eye, and by its aid many of the diseases incident to that important organ had recently been more minutely investigated.

Dr. CHARLES TAYLOR, Honorary Surgeon to the Eye Dispensary, then proceeded to read his paper. It dealt with the optical defects of the human eye. Several neatly executed diagrams of the eye were exhibited on a black board, and the ophthalmoscope, referred to in the remarks of the President, was placed on a board near at hand. The lecture, which was entirely divested of technical terms, presented features of interest to all, more especially that portion devoted to a consideration of the proper methods of selecting spectacles in cases of aged, short, and oversight. The fractional calculations and mathematical formulæ used for the purpose of selecting an accurately-adapted glass were extremely curious, and from the lecturer's observations, it was apparent that they have not been properly understood until within the last few years.

At the close of the lecture the President proposed a vote of thanks to Dr. Taylor, which was carried unanimously.

Mr. J. H. ATHERTON then read a short paper on the "Solubility of Bismuth," exhibiting phials of the preparation. He explained the process by which he had prepared it, which was founded on the experiments of Mr. Draper, of Dublin, and others, respecting the solubility of certain metallic oxides, in the citrates of the alkalies.

Mr. Atherton had made several attempts before he succeeded in obtaining a preparation which should be of the same strength as that prepared by Mr. Schacht, of Clifton. The ammonio-citrate of iron, he thought, was a preparation analogous to the soluble bismuth, and he hoped the latter would be of equal service to the medical profession.

ORIGINAL ARTICLES.

NEW AMERICAN REMEDIES.

BY PROFESSOR BENTLEY, F.L.S., M.R.C.S. ENG., HONORARY FELLOW OF, AND PROFESSOR OF BOTANY IN, KING'S COLLEGE, LONDON, ETC.

(*Continued from p.* 216.)

XIV. HYDRANGEA ARBORESCENS, *LINN.*—COMMON HYDRANGEA, SEVEN-BARKS.

HISTORY.—The root of this plant appears to have been employed for ages among the Cherokee Indians, in North America, as a remedy for calculous and gravelly deposits in the bladder.* A knowledge of its virtues was first gained from the Indians by Dr. E. Butler, who resided amongst them for a long time as a missionary; and we learn from his son, Dr. S. Worcester Butler, that he employed it with very great success in the treatment of calculous complaints, which are stated to be very common amongst them.† Various reports have since

* See 'Report on the Medicinal Plants of the Cherokees,' in Proc. Amer. Pharm. Assoc. for 1859, p. 394.

† 'New Jersey Medical Reporter,' Oct. 1850, p. 44; and Amer. Journ. Pharm., vol. xviii. 1852, p. 13.

from time to time appeared in the same journal and elsewhere, more or less confirmatory of its remedial virtues in the diseases first recommended by Dr. Butler.* Amongst other physicians who have thus written of, or testified to its advantages, we may mention, Dr. Monkur, of Baltimore; Dr. Bates, of New Lebanon Springs; Dr. D. Horsley and Drs. Atlee, and John Neill, of Philadelphia.† Parrish also, in his 'Practical Pharmacy,'‡ thus speaks of this remedy :—"I have prepared fluid extract of hydrangea for several years, during which time I have dispensed it, under the direction of several practitioners, to numerous patients, and with general satisfactory results, in irritable conditions of the urethra, though its value as a specific remedy requires confirmation." Probably this remedy may turn out, when tried in this country, to be of little, if any, value in the diseases for which it has been so highly recommended in various parts of North America; but a drug which will in any degree tend to prevent, or interfere with the formation of calculi and gravelly deposits in the bladder, and thus save our constant resort to the painful and frequently dangerous operations of lithotrity and lithotomy, would be an immense boon to suffering humanity; and with this view, we especially introduce to the notice of the medical profession in this country, a new remedy which is stated to have that effect; and we trust it will have a careful and extended trial, in order to confirm or otherwise its reputed medicinal properties.

SYNONYMS.—This plant is the *Hydrangea arborescens*, Linn. Spec.; Lam. Ill. t. 370; Bot. Mag. t. 437; Willd. Spec. vol. ii. p. 633; De Cand. Prod. vol. iv. p. 14; and Torrey and Gray's Fl. North America, vol. i. p. 591. It is the *Hydrangea vulgaris*, Michaux, Fl. vol. i. p. 268; and Pursh, Fl. vol. i. p. 309, according to Torrey and Gray's Fl. p. 591, but De Candolle, in his 'Prodromus,' vol. iv. p. 14, refers Pursh's plant in part to *Hydrangea cordata*. It is the *Hydrangea frutescens*, Mœnch. The first name is that now commonly employed, and hence has been adopted by us. In common language the plant has been termed the Common Hydrangea, Seven-Barks, and Wild Hydrangea.

Etymology.—The generic name, *Hydrangea*, is derived from ὑδωρ, water, and αγγειον, a vessel. The genus obtained this name, either from the vase-like shape of the fruits of some of the species, or, more probably, on account of the common garden species, *Hydrangea hortensis*, requiring for its successful cultivation in the summer months, an enormous supply of water; a large plant, it is said, as much as ten or twelve gallons daily.§ The specific term, *arborescens*, refers to the shrubby character of the species now under notice. The origin of the common names of Wild Hydrangea and Common Hydrangea is at once evident, but that of Seven-Barks is not manifest.

BOTANY.—The genus *Hydrangea* has at different times been variously placed by systematic botanists. By Schultz and others it was put into the Natural Order Cunoniaceæ; by Adanson, in Portulaceæ; by Jussieu, in Saxifragaceæ; by De Candolle, Torrey and Gray, and others, it is referred to the Natural Order Saxifragaceæ, suborder Hydrangeæ; by Siebold and Zuccarini, and also by Lindley, it was put in Hydrangeaceæ; and following Lindley's example we have placed it in our 'Manual of Botany' in Hydrangeaceæ. ||

Generic Character.—*Flowers* either all fertile, or more commonly the marginal ones sterile. *Sterile Flower*:—*Calyx* membranaceous, coloured, 4–5-parted. *Petals*, *stamens*, and *carpels*, rudimentary, or absent. *Fertile Flower*:—*Calyx*

* 'Reporter,' as above, Sept. 1854, pp. 393 and 416; Oct. 1854, p. 426, and March, 1855, p. 115.

† Amer. Journ. Mat. Med., vol. iii. Feb. 1861, p. 53.

‡ Parrish's 'Practical Pharmacy,' 2nd edit. 1859, p. 205.

§ Loudon's 'Encyclopædia of Plants,' 366.

|| For the diagnostic characters of the Hydrangeaceæ refer to Lindley's 'Vegetable Kingdom,' p. 569, and Bentley's 'Manual of Botany,' p. 540.

with the tube adnate to the ovary, hemispherical, 8–10-ribbed; limb 4–5-toothed, persistent. *Petals* 4–5, ovate, sessile, regular. *Stamens* twice as many as the petals. *Styles* 2, distinct. *Capsule* crowned with the styles and the limb of the calyx, 2-celled below, 1-celled above, opening by a foramen between the styles. *Seeds* numerous, membranaceous, reticulated. *Shrubs. Leaves* opposite, exstipulate. *Flowers* in corymbose cymes, white or rose-coloured; the marginal ones usually sterile and radiant, showy.*

Specific Character.—Shrub from 4–8 feet high. *Leaves* ovate or cordate, generally acuminate, 3–6 inches long, serrately toothed, smooth or slightly pubescent, and green on both sides. *Flowers* in flat fastigiate cymes, all fertile, or rarely all radiant like the common *Hydrangea* of our gardens.†

Habitat.—This species of *Hydrangea* is only found in a native state in North America, where it is more or less abundant throughout the Southern, Middle, and Western States. Torrey and Gray, in their Flora, say that it occurs on the shady banks of streams, from Pennsylvania to the mountains of Georgia, and west to Missouri. It is also found growing on the sides of hills and mountains, and is said to be abundant in the Susquehanna and Schuylkill valleys. In North America it flowers about the end of June and in July. The flowers are showy, and hence are frequently used in Philadelphia for bouquets, etc. The plant was introduced into this country in the early part of the eighteenth century; but the commonly cultivated *garden Hydrangea* is not this species, but, as already noticed, *Hydrangea hortensis*, a plant originally introduced from China and Japan, where it is supposed to have been originally a native, although it has as yet never been found growing wild.

Collection, etc.—The most active portion of the plant is said to be the root; in fact, so far as I know, it is the only part that has been used as a remedial agent. This should be collected in the autumn months, or early in the spring before active vegetation has commenced. When fresh, the root is very fleshy and soft, and should be then, if of any thickness, cut into transverse slices of moderate length, and dried carefully by a moderate heat.

General Characteristics.—As imported, the root of *Hydrangea arborescens* (which, as just noticed, is the only part used as a remedial agent) is found cut into slices of various sizes and lengths, and mixed in a greater or less proportion with the smaller branches or rootlets. These rootlets are either attached to the larger portions of the roots, or unconnected to them.

The slices of the main root or larger branches vary in length from about a quarter of an inch to one inch and a half, averaging about three-quarters of an inch; but pieces of two, three, four, or even more inches in length are occasionally found mixed with them. In thickness they vary, generally from about an eighth to half an inch, averaging above a quarter of an inch. They are nearly cylindrical in shape; and straight, or somewhat twisted, especially if of any great length. The colour varies according to their size, etc., from pale-yellow to yellowish-brown. Their external surface is more or less rough, from the presence of minute sharp protuberances, and the remains of the broken-off rootlets. Some of the pieces have attached to them branches and rootlets, which in certain cases are some inches in length. Other pieces are enlarged above into a tuberosity, which shows traces of the parts to which the aerial stems were originally attached. The moderate-sized pieces break with a close fracture; the larger ones are broken with difficulty; all of them are very tough and difficult to reduce to powder. They have a peculiar, somewhat aromatic odour;

* De Candolle's 'Prodromus,' vol. iv. pp. 13 and 14; Torrey and Gray's 'Flora of North America,' vol. i. p. 591; and Gray's 'Manual of the Botany of the Northern United States.'

† Torrey and Gray, as above; Amer. Journ. Pharm., vol. xviii. 1852, p. 15; and Wood and Bache's 'United States Dispensatory,' 11th edit. p. 1425.

and a peculiar, aromatic, somewhat pungent, and by no means disagreeable taste. The odour and taste are most evident in the bark or cortical portion, especially so after chewing a piece for some time.

The transverse section of the larger slices shows a large pith of a whitish colour and glistening appearance, surrounded by a whitish, or whtish-yellow, compact wood, and on the outside of which is a thin yellowish, or yellowish-brown bark, or cortical portion, readily separable, in most cases, from the wood beneath.

The *rootlets*, which are detached, or adherent to the larger pieces, are commonly, especially in the former case, many inches in length. In size they vary from pieces about that of a horse-hair to that of a knitting-needle. They have a very compact tough texture; and consist of a thin, yellowish, easily detached cortical portion, surrounding a hard woody portion or meditullium, which presents no traces of a pith or medulla. In taste and odour they resemble the larger pieces already described.

COMPOSITION AND CHEMICAL CHARACTERISTICS.—The root of *Hydrangea arborescens* was analysed by Joseph Laidley, of Richmond, Virginia.* His experiments indicated the presence of *gum, albumen, starch, resin, soda, lime, potassa, magnesia, sulphuric* and *phosphoric acids*, and a *proto-salt of iron*. No *alkaloid* or any other constituent was found, which would account for its reputed active properties. Mr. Laidley thought that the activity of the root was due to some combination of the constituents, and that much was owing to the large amount of mucilaginous matter contained in the root. We should be inclined to infer, from the above analysis, that the root was destitute of any very powerful properties.

An infusion of the sliced root well bruised, in the proportion of one ounce to thirty ounces of boiling water, and allowed to macerate for twenty-four hours, had a pale-yellow colour, a peculiar and very slightly aromatic taste, and a peculiar, feebly aromatic, pungent, and by no means disagreeable taste. It exhibited the following reactions:—*Tincture of iodine* caused a violet-black coloration, but no precipitate; *solution of persulphate of iron*, a very slight greenish-black coloration, but no precipitate; *solution of perchloride of iron*, a slight greenish-brown coloration, but no precipitate; *solution of oxalate of ammonia*, a plentiful whitish, light, gelatinous-like precipitate; *solution of baryta*, an abundant brownish-yellow, gelatinous-like, flaky precipitate; *solution of nitrate of baryta*, slowly produced a plentiful, light, whitish, somewhat flaky precipitate; *solution of acetate of lead* caused an opalescent appearance, and formed in a short time a plentiful yellowish-brown, light precipitate; *solution of basic-acetate of lead* caused a milky appearance, and slowly caused a plentiful yellowish-white, light precipitate; *solution of bichloride of mercury* rendered the infusion somewhat opalescent, but produced no marked precipitate; *solution of bichloride of platinum* had a nearly similar effect to the preceding; *solution of nitrate of silver* caused a plentiful brownish, somewhat flaky precipitate; *solution of sulphate of copper* had no very evident effect at first, but ultimately produced a marked brownish, light precipitate; *solution of chloride of lime* discharged the colour, and formed a whitish, somewhat flaky, floating precipitate. No evident effects were produced by *litmus* or *turmeric papers*, nor by *acetic, hydrochloric, nitric*, or *sulphuric acids;* nor by *tincture of galls;* nor by the addition to the infusion of either of the following solutions:—*Solution of potash, ferridcyanide of potassium, ferrocyanide of potassium, chromate of potash, carbonate of potash, sulphate of soda, ammonia, gelatine, potassio-tartrate of antimony, sulphate of lime, and chloride of calcium.* Some of the reactions, as given above by us, differ in certain cases from those obtained by Mr. Laidley, and which he has published in his paper already referred to.

* 'American Journal of Pharmacy,' vol. xviii., Jan. 1852, p. 20.

By the application of *solution of ammonia* to a clean transverse section of the root, the cortical portion was rendered somewhat reddish-brown, and the wood became yellowish; the pith alone remaining unaltered. *Sulphuric acid*, applied in like manner, caused the regions of the root to be more evident, and all of them, except the pith, to assume a yellowish colour. By adding *nitric acid* all the parts became more evident, and all outside the pith, which was unaltered, assumed a reddish-brown tint; and *hydrochloric acid*, applied in like manner, produced no change in the medulla, but rendered the wood slightly yellow, and the cortical portion dark yellowish-brown.

Medicinal Properties and Uses.—In the 'American Journal of Materia Medica,' the following notice of its medicinal properties and uses is given:*—"Dr. Butler says: 'What I particularly wish to call attention to is the fact that a remedy exists which has been successfully employed for removing calculi after they have been formed. The effect the remedy seemed capable of producing is removing, by its own specific action, from the bladder such deposits as may be contained in that viscus, provided they are small enough to pass the urethra. It has seemed also to have the power of relieving the excruciating pain attendant on the passage of a calculus through the ureter. Whether this is dependent upon any anodyne property which the remedy may possess, or upon its action in removing the cause by promoting the discharge of the calculus, I know not, but think most likely on the latter. The power of curing stone in the bladder does not appear to be claimed for it. It is only while the deposits are small, when in that form of disease known as gravel, that it is an efficient remedy; then, by removing the nuclei, which, if allowed to remain in the organ, would increase in size and form stone, the disease is averted. Employed at this stage of the disease, it has proved beneficial in nearly every instance, and as many as 120 calculi have been known to come from a person under its use. In an overdose it produces unpleasant symptoms, such as dizziness of the head, oppression of the chest, etc.' Dr. Monkur, of Baltimore, says: 'I regard the hydrangea, in properly selected cases, *as sure in its remedial agency as we may express of any other medical substance.*'" In the hospital, he directed its use in mucous irritation of the bladder in aged people, chronic gleet, and, in a very difficult condition to cure, the prostate mucous emissions, and the report was favourable to its use. Dr. Atlee, of Philadelphia, publishes an account of a case in the hands of Dr. D. Horsley, where the patient passed a stone the size of an ordinary marble. Dr. Bates, of New Lebanon Springs, has lately treated several cases of lithiasis with the hydrangea, and with the best success. In each case a number of calculi passed from the patients upon the use of this agent." A number of other favourable notices of the beneficial operation of hydrangea might be given from American publications, but we have quoted sufficient to show that, it is a remedial agent which, to say the least of it, is well worthy of a trial in this country.

Administration, Preparations, and Doses.—The best mode of administering hydrangea—that which was adopted originally by Dr. Butler, and which is now general in Philadelphia—is in the form of a kind of fluid extract, prepared as follows:—

Fluid Extract of Hydrangea.—Take of root of Hydrangea, sliced and well bruised, *two pounds*; water *ten pints*. Boil to three pints, strain, and add *thirty-two fluid ounces* of honey, and then boil further to a pint and a half. This is the original receipt of Dr. Butler. Parrish recommends the following modified formula for its preparation:—Take of Hydrangea *one pound*; water, *five pints*. Boil the root in successive portions of water for a long time; mix this with *thirty-two fluid ounces of honey*, and further evaporate to a pint and

* Amer. Journ. Mat. Med., vol. iii. p. 52.

a half.* In the summer season push the evaporation somewhat further, and add eight ounces of brandy. The dose of the above extract is a teaspoonful twice or three times a day.

ADDITIONAL NOTE ON THE MANUFACTURE OF BALSAM OF PERU.

BY DANIEL HANBURY, F.L.S.

In my paper on Balsam of Peru published in the last number of the Pharmamaceutical Journal, I endeavoured to show

1. That that drug has been always a production of Guatemala, or rather of that part of it which is now called Salvador.
2. That the tree which yields it is the *Myroxylon Pereiræ* of Klotzsch.
3. That it acquired the name of *Balsam of Peru*, solely from the circumstance of it being transported to Europe by way of Peru.

Since communicating to the Society that paper, I have referred to several of the early writers on Central America, in the hope of finding further confirmation of the opinions above expressed. In this I have not been wholly unsuccessful, as the following brief extracts will show.

Father Joseph de Acosta in his *Historia Natural y Moral de las Indias* published at Seville in 1590, says:

"... . That which is more important, is that for making the Chrism which is so necessary in the Holy Church and so greatly venerated, the Apostolic See has declared that with this Indian balsam, chrism is to be made in the Indies, and with it that of the Sacrament of Confirmation and those moreover used in other ceremonies of the Church.

"Balsam is brought to Spain from New Spain; and it is in the provinces of Guatemala and Chiapas and others in those parts that it most abounds, although the most precious is that which comes from the island of Tolu in Terra Firma, not far from Carthagena."†

Herrera, who wrote a History of the West Indies published at Madrid in 1601, states in describing Guatemala, that

"there are found in this province many fountains and springs of hot water having different properties, virtues and colours: there is fine balsam in abundance, which the Spaniards knew without learning it from the Indians, notwithstanding what a certain author has written. Moreover there is liquidambar, copal and suchicopal and other kinds of gums and juices, very perfect. . . . The harbour of Acaxutla near Trinity [Sonsonate] at 13° degrees of latitude, is the principal port of the province for going to New Spain and Peru."‡

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* 'American Journal of Pharmacy,' vol. xxvii., 1855, p. 229; and Parrish's 'Practical Pharmacy,' second edition, 1859, p. 205.

† "... . Lo que mas importa es, que para la substancia de hazer Chrisma, que tan necessario es en la sancta Iglesia, y de tanta veneracion, ha declarado la Sede Apostolica, que con este Balsamo de Indias se haga Chrisma en Indias, y con el se de el Sacramento de Confirmacion, y los de mas, donde la Iglesia lo usa. Traese a España el Balsamo de la nueva España, y la provincia de Guatimala, y de Chiapa, y otras por alli es donde mas abunda, aunque el mas preciado es, el que viene de la Isla de Tolu, que es en Tierrafirme no lexos de Cartagena."—lib. iv. c. 28.

‡ "On trouve en ceste province plusieurs fontaines et sources d'eaux chaudes ayant diverses proprietés, vertus, et couleurs: il y a du bausme, beau et beaucoup, que les Espagnols cognurent sans l'apprendre des Indiens, contre ce qu'un auteur en escrit. Plus il y a de l'ambre liquide, la gomme anime, copal et suchicopal, et autres sortes des gommes et liqueurs très-parfaits. . . . . Le havre Acaxutla pres de la Trinité à 13 degrés de haulteur, est le principal port de la province, pour aller en Neuf Espagne, et en Peru." *Description des Indes Occidentales, traduit de l'Espagnol, Amst.* 1622, cap. xii. I have also consulted the Spanish edition published at Madrid, 1601-15.



Indians collecting Balsam at Juisnagua near Sonsonate.

The following passage from De Laet's *Novus Orbis seu Descriptio Indiæ Occidentalis*, a work held in deserved esteem, is of peculiar interest as proving that the custom of charring the trunks of the balsam-trees was pursued by the Indians in early times, while the Spaniards had their own method of collecting the balsam. It occurs in the chapter headed "*San Salvador, San Miguel, Chuluteca —specialis descriptio harum provinciarum et eorum quæ habent peculiaria*," and may be thus rendered:

"On the borders of the district of Guaymoco, grow many trees which afford balsam; and the entire coast, which is called *Tonala*, produces trees the timber of which is exceedingly compact and heavy, and of which in a certain temple there are columns fifty feet in height. In the summer the natives collect the juice of the balsam-tree, after slightly burning the bark of the stem; but the Spaniards allow it to exude by itself: the tree bears fruit like almonds, which contain a golden-coloured juice."*

The opposite woodcut, taken from a coloured sketch made upon the spot by Dr. Dorat, represents the collection of the balsam at Juisnagua near Sonsonate.†

A NEW ALKALOID FOUND IN *ACONITUM NAPELLUS*: DESCRIPTION AND MODE OF PREPARATION.

BY MESSRS. T. AND H. SMITH.

In lately separating aconitina from *Aconitum Napellus*, a crystalline substance, new to us, presented itself, and on closer examination we found it to be possessed of alkaline properties. This circumstance interested us much; and not knowing of any like substance having been mentioned by any one who had examined *Aconitum Napellus*, we have thought a short statement of its characteristics, so far as they have yet been ascertained by us, might be acceptable to your readers.

Two characters of the substance render its separation exceedingly simple and easy,—these are, its almost absolute insolubility in neutral watery liquids, and its great solubility in excess of acid.

The juice of aconite-root having been evaporated to a soft extract, is exhausted with spirit of wine, and the spirit having been distilled off, the remainder is brought to an extract, which is also submitted to the action of spirit of wine, to be exhausted.

The spirituous liquid is now mixed up with milk of lime, using 1½lb. for every cwt. of the fresh root. After filtration sulphuric acid is added, till there is no further precipitate. The spirituous solution being now filtered, is submitted to distillation for the recovery of the spirit. The watery portion left, after the separation of an abundant, dark-green, fatty matter, is filtered.

The liquid is now in a state for obtaining the new alkaloid. The liquid will be found strongly acid, and it is in virtue of this strong acid state that the substance in question is kept in solution, for it separates as soon as the acid is neutralized. A strong solution of carbonate of soda is therefore now added, at

* "In finibus Guaymoco pagi, plurimæ nascuntur arbores, quæ Balsamum edunt; universaque ora, quam *Tonalam* vocant, nutrit arbores admodum firma atque ponderosa materie, e qua in quodam templo reperiuntur columnæ quinquaginta pedes altæ. Indigenæ liquorem Balsami colligunt æstate cortice trunci leviter adusto; Hispani autem per se emanare sinunt: fert arbor illa fructus amygdalis similes, quibus inest succus aurei coloris." *Novus Orbis seu Descriptionis Indiæ Occidentalis, Libri* xviii., authore Joanne de Laet, Lugd. Batav. 1633, lib. vii. c. 11.

† 1. The burning of the bark, after it has been loosened by beating. 2. A tree to the stem of which rags have been applied in order to absorb the balsam as it exudes. 3. Boiling the saturated rags. 4. Pressing the rags after boiling. 5. Women waiting to fill the *tecomates* or gourds, and a woman so employed.

first very freely, as strong effervescence on the addition of more soda shows unmistakably the existence of excess of acid. Towards the end, however, the addition of the alkali must be more carefully made, and at considerable intervals; at the same time taking care to stir repeatedly and briskly. When the fluid has been brought to a nearly neutral state, but still slightly acid, it is to be left to itself for a day or two. None of the aconitina can be thrown down till the liquid become alkaline.

The next step to be taken is to filter the liquid from the abundant precipitate, which separates partly as a loose powder, and partly as a crystalline deposit on the sides of the precipitating vessel. This precipitate gives the new body observed by us, and, so far as we are aware, for the first time now described. We propose to name it Aconella.

It is easily obtained pure in snow-white crystalline tufts, by repeated crystallization from boiling spirit, with the aid of a little pure animal charcoal; for although it is very sparingly soluble in cold spirit, it has considerable solubility in boiling spirit, from which it readily crystallizes almost entirely on cooling.

Aconella is very insoluble in water, so much so that if a fraction of a grain be dissolved in a few ounces of water weakly acidulated, the clear liquid, on the addition of an excess of ammonia, becomes quite milky. It is soluble in 11·4 parts by measure of boiling rectified spirit (density ·840), but on cooling only about $\frac{1}{800}$ part is retained in solution.

It is moderately soluble in sulphuric ether, much more so in acetic ether, and quite remarkably so in chloroform,—comparable to camphor in this liquid, or powdered sugar in water.

It burns entirely away on platinum foil. When heated with soda lime, abundance of ammoniacal vapour is given off.

Aconella is precipitated from watery solutions by tincture of iodine.

Tannin does not precipitate the muriate, but the oxalate is precipitated by it. Corrosive sublimate precipitates aconella, as do also the terchloride of gold and the chloride of platinum.

One remarkable character belonging to it is its great tendency to crystallize, equalling, perhaps, in this respect even cantharidine itself, and thus permitting of its being confounded with but very few other bodies.

It will be unnecessary to give more than one very striking example to prove this. On evaporating two ounces of a cold saturated spirituous solution containing about three grains of the alkaloid to dryness, in a flat Berlin dish, and at a heat of about 120° Fahr.; instead of drying up, as might have been anticipated, in an amorphous state, every particle of the substance showed itself in a beautiful crystalline condition, white shining needles covering the whole bottom of the dish.

Although insoluble in water, it is very soluble in all the acids we have yet tried; and although these solutions be made in the presence of a large excess of the base, they invariably redden litmus; still, although such be the case, aconella, weakly however, turns reddened litmus-paper blue; for if a faintly reddened piece of litmus-paper be put into a boiling-hot spirituous solution, the blue colour of the test-paper slowly but unmistakably returns. Readily crystallizable as the alkaloid itself is, we have not yet succeeded in getting any of its salts to crystallize, with the exception of the muriate; and even this salt crystallizes but slowly. If, however, the pure alkaloid be dissolved in spirit by the aid of muriatic acid in a glass beaker, and the beaker be then set aside uncovered, at the ordinary temperature, in the course of a few days at about an inch from the surface of the liquid, a broad ring of most beautifully delicate radiated crystals make their appearance; and in some days more the now comparatively watery liquid sets into a mass of snow-white, foggy tufts, arranged round the bottom of the beaker in amphitheatre-like form, so as to leave the glass at the centre of the bottom quite clear and bright.

From the following additional proofs in connection with what has been already stated, there cannot, we think, be any doubt that the new substance must be classed among the natural organic alkalies.

Aconella does not appear to have any poisonous quality. We gave three decigrammes to a cat, without the production of any apparent inconvenience to the animal.

Its harmless character naturally suggests the question whether the admittedly weak action of most of the aconitina of commerce may not arise from its mixture with aconella. Putting aside the idea of intentional adulteration, its inferior potency could very well be accounted for by the presence of this substance, without involving any imputation of blame, and only indicating ignorance of the means to be adopted for securing the purity of the aconitina.

As both aconitina and aconella are precipitated by alkalies, it is very probable that this mixed precipitate has been accepted by some operators as pure aconitina. In the process of purification, unless a quantity of acid be used not greater than is necessary to redissolve *only* the aconitina, both will be redissolved, and at the next precipitation they will go down together as before.

If the aconella has not already been removed in the preparation of aconitina, its presence can be prevented by carefully avoiding more than the faintest acid reaction in redissolving the aconitina.

Aconitina is a strong alkaloid, and therefore at once turns reddened litmus blue; on the contrary, all the solutions of aconella in acids, strongly redden litmus; therefore after redissolving the precipitate of aconitina, mixed with aconella in acids, the liquid should show, after sufficient time and agitation, only a slight acid reaction, else the aconitina when again precipitated will be mixed to a more or less extent with aconella. Even the use of ether will not secure the absence of aconella, because although aconitina is very soluble in ether, aconella is not by any means insoluble in that liquid.

Another probable cause of the deterioration of aconitina when mixed with aconella may be the absorption of the aconitina by the charcoal used in bleaching it. Charcoal has so remarkable an attraction for aconitina, that we have often seen it entirely absorbed by the charcoal; so that in purifying a mixture of aconitina and aconella, it might very readily happen, that the substance ultimately obtained would not contain a trace of aconitina.

The quantity of aconitina given by 1 cwt. of the fresh roots, never, so far as our experience goes, exceeds 1 oz. A simple calculation founded on the comparative strength of the aconite-root and pure aconitina, perhaps the most potent of all poisons, will show that no possible means could yield much more than that quantity.

The crystallization of a hot spirituous solution of aconella in gaslight presents a very remarkable and beautiful appearance. The whole body of the liquid seems to be incessantly emitting minute flashes of light, something like what might be expected from a shower of minute particles of incandescent lime—a sort of deflagration, but in a liquid medium. The phenomenon seems to be caused by the reflection of the light from the faces of crystals, continually forming and moving in the liquid, as they present to the incident rays the proper angle of reflection to the eye of the observer.

It is a very remarkable fact, that the characters of aconella bear a great resemblance to those of narcotine. The similarity is so great that we have compared them together to a certain extent, and although the comparison has not yet been carried out to produce the conviction of absolute identity, yet so far as it goes, it leads to the belief, that aconella is nothing else than narcotine. We may carry out the comparison and give the results; but in the meantime we will give the points of resemblance ascertained betwixt the two alkaloids.

Aconella is without taste in the solid state, so also is narcotine; the solutions of both however are very bitter.

Aconella is a very weak alkali, very soluble in acids, and the solutions are all strongly acid; the same remarks apply to narcotine.

Tincture of iodine precipitates aconella, it also precipitates narcotine.

Tannin precipitates aconella from an oxalic acid solution, but not from one in muriatic acid, characters also common to narcotine.

Aconella is remarkably soluble in chloroform, and the solution, spontaneously evaporated, presents a peculiar appearance; the very same peculiarity of appearance is shown with narcotine. The crystallizations of the two alkaloids from spirit are also exact counterparts of each other. They are both insoluble in caustic alkalies. On adding strong sulphuric acid to narcotine, hardly any colour is produced, but on the addition of a minute particle of nitre a deep blood-red colour is at once displayed; aconella answers in exactly the same way to this test. A specific-gravity bottle filled with a boiling-hot spirituous saturated solution of aconella—density of spirit ·840—was found, after deducting weight of bottle, to weigh 9·53 grammes. The weight of the crystalline solid after evaporation was 0·89 gramme. Consequently 1 part of aconella dissolves in 9·6 parts by weight of boiling spirit, or 11·4 by measure.

The same experiment was made with narcotine, and it will be observed that the two bodies give the same solubility almost to a nicety. The narcotine and spirit in specific-gravity bottle weighed 9·55 grammes. The weight of crystallized narcotine was 0·90 gramme. The equivalent of aconella determined by calculations from data obtained by experiment is almost exactly that of narcotine.

	Grammes.	Platinum obtained. Grammes.		Percentage of Platinum.	Average of Platinum.
Weight of chloride of platinum and aconella manipulated upon.	3·065	0·465	=	15	15·66
	0·500	0·075	=	15	
	0·500	0·085	=	17	

	Aver. of Pt.		Comp.		Pt.	
Therefore	15·66	:	100	::	99	: x = equiv. of compound. $x = 632{\cdot}18$.

We thus obtain 632·18 as the equivalent of the double chloride.

As three equivalents of chlorine, one of platinum, and one of aconella make up the compound, the equivalent of aconella alone is obtained by deducting from the whole the chlorine and platinum.

$$\overset{\text{Cl.}}{35{\cdot}5} \times 3 = 106{\cdot}5 + \overset{\text{Pt.}}{99} = 205{\cdot}5$$

Deducting this sum from 632·18, we have 426·68 left as the equivalent of aconella.

Narcotine, $C_{46}H_{25}NO_{14}$, has as its equivalent 427, a number so close to the calculated equivalent of aconella, that it seems to change to reality the supposition of these two alkaloids being one and the same, though obtained from plants belonging to different Natural Orders.

Edinburgh, 18*th December*, 1863.

THE LIBRARY.

BY MR. JOSEPH INCE.

Our excellent Librarian, Mr. Charles Sharp, has kindly furnished me with most of the following information; indeed, so liberal has been the assistance of this gentleman, that my communication may be deemed official, and I am responsible only for the comment on the text. Having of late been under the necessity of consulting standard works of reference, and having personally tested the resources of our own collection, I was naturally led to inquire into the present condition and actual working of the Library, and I confess that on the outset I was surprised to find that through some inadvertence there was no an-

nouncement respecting its existence on the fly-leaf of the Journal, no account nor detailed report in the pages of that periodical,* and no mention (unless I am in error) of the name of the Librarian. I instantly concluded, drawing a reasonable inference, that the Library was essentially a dead letter; an institution tolerated, but not particularly esteemed, and considered more as an inevitable appendage to a learned Society than as a vital organ of progress and development. How agreeably was I disappointed to discover the marked appreciation of its value shown by many an earnest student, and the commendable assiduity with which its treasures have been from time to time consulted. With a good heart, therefore, has the present notice been drawn up, in order to bring its advantages still more prominently before the members, and we may yet hope to see the day when its books only, and not its claim to public recognition, may be shelved.†

The authorized prospectus of the Society contains the following announcement:—

The Library contains standard works on Chemistry, Materia Medica, Botany, and Physical Science, and complete sets of the most valuable English and Foreign Journals on the same subjects. The current Scientific Periodicals are regularly supplied in the Reading-Room.

Regulations for the Circulation of Books.

1. The Library and Reading-Room shall be open from Nine until Seven o'clock daily, excepting Saturdays.

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* [Has the author looked at the fly-leaf of the Journal? Had he done so, or read the Journal itself, he surely could not have penned this sentence.—Ed. Pharm. Journ.]

† Whilst on the subject of books, I take the opportunity of quoting the Society's Students' List. Those to whom this is no information will excuse its insertion here, for the sake of others to whom it may be useful.

BOOKS RECOMMENDED FOR STUDENTS.

Latin, Prescriptions and Pharmacopœia.

	£.	s.	d.
Selecta è Prescriptis (Churchill)	0	5	0
Pharmaceutical Latin Grammar (Groombridge)	0	5	0
*British Pharmacopœia	0	6	0

Botany.

Class-Books for Students.

	£.	s.	d.
*Bentley's Manual of Botany (Churchill)	0	12	6
Balfour's Class-Book of Botany (A. and C. Black)	1	11	6

Systematic Botany.

	£.	s.	d.
Lindley's School Botany (Bradbury and Evans)	0	5	6
Lindley's Vegetable Kingdom (Bradbury and Evans)	1	16	0

British Botany.

	£.	s.	d.
Babington's Manual of British Botany (Van Voorst)	0	10	6
Bentham's British Flora (Reeve)	0	12	6
Withering's British Botany (E. Law)	0	10	6

Materia Medica.

	£.	s.	d.
*Royle's Manual of Materia Medica (Churchill)	0	12	6
Pereira's Elements of Materia Medica (Longman)	3	15	0
Christison's Dispensatory	0	18	0

Physics.

	£.	s.	d.
Dr. Golding Bird's Elements of Natural Philosophy, by C. Brooke (Churchill)	0	12	6

Chemistry and Pharmacy.

	£.	s.	d.
*Bowman's Practical Chemistry (Churchill)	0	6	6
*Fownes's Manual of Chemistry (Churchill)	0	12	6
Miller's Elements of Chemistry (Parker)	2	6	6
Parnell's Elements of Chemical Analysis (Walton and Maberly)	0	9	0
*Möhr and Redwood's Practical Pharmacy (Walton & Maberly)	0	6	6
Wittstein's Practical Pharmaceutical Chemistry (Churchill)	0	6	0
Christison's Dispensatory	0	18	0
Hints to Apprentices and Students preparing to pass the Examinations of the Pharmaceutical Society	*gratis on application.*		

* Text-Books used.

2. Members of the Society, whether residing in London or the country,* may obtain books on making personal or written application for them; but no Member shall have more than two volumes at a time, nor shall he keep any book for a longer period than fourteen days. But when a book is returned by a Member it may be borrowed by him again, provided it has not been bespoken by any other Member. Books which have been bespoken shall circulate in rotation according to priority of application.

3. Associates, Apprentices, and Students of the Society may obtain books on presenting an order from a Member, who shall in all cases be responsible for their safe keeping and return.

4. The scientific journals shall not be circulated until the volumes are completed and bound. Works containing valuable plates, and a few standard works of reference, which are distinguished in the Catalogue by a mark (*), shall not be circulated.

5. Members retaining books longer than the specified time shall be subject to a fine of One Penny per day for each volume so retained. If any book be retained by a Member for three months, and be not returned after written application has been made for it, the Council may order it to be replaced, and charge the Member in default with the amount thus incurred, in addition to the fine. If any book, when returned by a Member, is found to have been damaged during the period such Member has had it, a fine equivalent to the injury shall be paid by the Member.

6. The Library shall be closed for a fortnight once a year, to admit of the revision of the books.

Before entering on any discussion with regard to these regulations, it may be as well to give a general idea of the class of books here offered. The Library consists of about 3000 volumes, including,—

1st. A tolerably complete collection of works on Materia Medica, which, leaving out of the question what is contained on the subject in classical works, as Pliny and others, commences with the Ortus Sanitatis, date 1517, (A work with no author's name, but which is compiled from, or owes its origin to, the Liber Pandectorum Medicinæ of Mattheus Silvaticus, published in Venice some thirty-eight years before,) and, continuing through the 17th and 18th centuries, ends with Pereira.

2nd. A good collection of Dispensatories and Pharmacopœias, perhaps as complete as any to be met with in a public library other than that of the British Museum, or the College of Physicians. Besides foreign Pharmacopœias there is the whole series of the London, with the exception of the two first. It is stated that the College of Physicians does not possess the first. These works are in constant demand for reference.

3rd. A fair collection of chemical works, comprising translations and abstracts of nearly all the old alchemists, with a few original editions of their tracts, and all the standard works on Chemistry published in England to the present time.

4th. A good assortment of Botanical works, including some illustrated books, valuable for reference, in connection with Medical Botany. This collection includes the old folio Herbals of Gerarde, Salmon, Parkinson, and Culpeper.

5th. There are a few modern works exclusively relating to Practical Pharmacy, but the majority of the old books on this subject are included in the dispensatories and herbals and some chemical works.

6th. A very complete set of the principal English and French scientific and medical journals. This includes the Transactions of the Royal Society, Society of Arts, Royal Institution, American and Continental Societies, and dates from an early period. There are also a few odd volumes of German journals; but from the fact that they meet with very few readers, these have not been provided regularly.

7th. What may be termed Miscellaneous; viz. works on Natural History, Natural Philosophy, and most of the collateral branches, Dictionaries, Catalogues, etc.

* Country Members must bear the expense of carriage of books.

This is something like a general idea of what the Library contains. It will be seen, however, by the Catalogue, that we are very deficient in more recent works, and especially in the last editions of foreign Pharmacopœias.

The last catalogue is dated 1853; an Appendix is in course of preparation, which in some sense will be more valuable than the first catalogue, since it will contain the most recent books, and many new editions of old ones. The Catalogue, with Appendix, will be furnished at the cost of one shilling. Here is a list of the chief of its Periodical Literature :—

WEEKLY.

Lancet.	Medical Circular.	Chemical News.
Medical Times.	Athenæum.	Comptes-Rendus.
British Medical Journal.	Society of Arts' Journal.	

MONTHLY.

Edinburgh Medical Journal.	British Journal of Dental Science.
Annals and Magazine of Natural History.	The Dental Review.
Zoologist.	The Technologist.
Journal of Botany.	Journal of Chemical Society.
Philosophical Magazine.	Photographic Journal.
Educational Times.	Veterinarian.
Chemist and Druggist.	Pharmaceutical Journal.

BI-MONTHLY.

American Journal of Pharmacy.

FRENCH MONTHLY.

Annales des Sciences Naturelles.	Journal de Chimie Médicale.
Journal de Pharmacie.	Répertoire de Chimie Pure et Appliquée.
Annales de Chimie et de Physique.	

Revista Farmacéutica. (Published by the Pharmaceutical Society of Argentine, S. A.).

QUARTERLY.

Medico-Chirurgical Review.	Quarterly Journal of Microscopical Science.

AT IRREGULAR INTERVALS.

Proceedings of the Royal Society.	Proceedings of the Medical and Chirurgical Society.
" " Royal Institution.	Bulletin de la Société Chimique de Paris.
" " Linnean Society.	" " Société de Botanique de France.

The number of periodicals, weekly, monthly, and quarterly, placed upon the table, number 37, of which 19 are either exchanges for the 'Pharmaceutical Journal,' or sent free by various Societies.

All the English and French periodicals are very generally read. The back volumes are also much referred to. The current numbers are read by those who use the reading-room, and the volumes are used more especially by members and others for the purpose of consulting particular papers.*

The average circulation of books is about 40 per month. Many of these are books which must be used for the purpose of gaining special information useful to the reader, and have more generally reference to pharmacy.

Few books are taken out simply for *reading*, as in an ordinary library, nor has this circulation but little reference to Students' text-books, it being understood that they possess copies of their own.

The average attendance of readers during last session was 258 per month, subject to the deductions mentioned below.

* Agent for Continental Medical Literature, Hippolyte Baillière, 219, Regent Street, W. Agent for American Publications, Trübner and Co., 60, Paternoster Row, E.C.

About one-third of the books consists of bound volumes of the most valuable scientific journals, in most cases complete sets, while the other two-thirds comprise, in about equal numbers, works of reference, manuals, and old works relating to Chemistry and Pharmacy. About one-half of the books on the Catalogue may be fairly said to be in circulation.

The following table will show the extent to which the Library and Reading-Room are used, being the average number of readers and circulation of books during the months of January, February, March, and April, of 1862:—

	No. of Readers.	Circulation.
January	222	36
February	278	41
March	269	52
April	265	34
	1034	163
Monthly Average	258	41

These numbers represent the readers, but it must be borne in mind that the same persons are numbered again and again, and that at least three quarters were students who were using the Library for the purpose of reading up for their examinations, so that the yearly average of persons using the Reading-Room may be stated at 1000.

The prospect is encouraging, and far brighter than any anticipation I had dared to form; and yet I venture respectfully to state, that without any violent alteration, the sphere of the Library may be most advantageously extended.

The Librarian has already made a sound practical suggestion to the Committee of Management which deserves attention.

He proposes a yearly subscription of two guineas to Lewis's Scientific and Medical Library,* which would enable the Committee to have constantly upon the Reading-Room table four of the most recent works on Science, thus affording the members an opportunity of seeing the latest scientific works, and adding an attraction to the Library, and an inducement to the members to use it, at a very trifling expense.

He further advises that a small definite sum (£10) might be set apart annually for the purchase of additions to the Library. This would ensure a constant and sure increase in the number of books, and would at the same time be more satisfactory to the Committee, as from their knowledge of the demand for books they might be able to supply it at a settled rate, and at a known annual expense to the Society. This would be greatly facilitated by a subscription to Lewis's Library, as the passage of recent books during a year through the Reading-Room would show what works were most in demand and most desirable to purchase, and these might be had at a very reduced cost by buying surplus copies at the end of each year.

Upon one point I must venture to dissent from an opinion that has been occasionally offered. I believe it would be no advantage to extend the usual

* H. K. Lewis's Medical and Scientific Library, 15, *Gower Street North, London, W.C.*—This Library was established in 1852 for supplying, on hire, New Books and the most recent Editions in Medical Literature and Science generally, without limit or delay, to individual Subscribers and Book Clubs throughout the United Kingdom. Books may be retained as long, or exchanged as frequently, as suits the convenience of Subscribers; and for any book retained as a purchase, an extra supply will be allowed in the next exchange. (Library hours: 9 A.M. to 7 P.M.; Saturdays, till 4 P.M.) Surplus books withdrawn from Circulation are sold at reduced prices. Amongst the Periodicals circulated are, 'Transactions of the Royal Society,' 'Philosophical Magazine,' 'Annals of Natural History,' 'Quarterly Journal of Microscopical Science,' 'Intellectual Observer,' 'Westminster Review,' 'Popular Science Review,' 'Natural History Review.' Two Guineas per Annum. Four Volumes at a time. Catalogue, with Supplement for 1862, gratis; and Boxes are provided for the Conveyance of Books.

Library hours. It cannot be expected (knowing the nature of a Druggist's business) that the Library will ever be much patronized as a Reading-Room. The experiment has been already tried by the late Mr. Jacob Bell, and he was known to have expressed his disappointment at the failure of the arrangement. There was the Librarian, the gas, a good fire, and every accommodation; but there were no readers. The scheme signally collapsed, and I do not see any just ground for anticipating a different result.

The growth of the Library must be exogenous, from within outwards. The books must be brought in contact with the readers; the readers, for obvious reasons, can never be brought in contact with the books. Nor do I think we can reasonably expect Members, still less Assistants, who have been confined for successive hours by the imperative exactions of long trade hours, to spend their one spare evening in literary pursuits. Many a weary worker will hail with pleasure the reception at his own home of standard works and of first-class scientific periodicals, which will serve the double purpose of breaking up the routine monotony of his occupation, and of keeping his mind well stored with the current intelligence of the day. But I cannot help putting a most lenient construction, if not confessing the profoundest sympathy with the Assistant, who, on the welcome advent of his weekly holiday, sees greater attraction in an evening walk than in mental culture, and who *Re* Pleasure *versus* Science, gives his verdict for the Plaintiff.

Let me now subjoin a few plain suggestions:—

I. That the first clause of Rule IV., "The scientific Journals shall not be circulated until the volumes are completed and bound" be rescinded as far as London members are concerned, and that the whole of the Periodicals issued weekly or at other intervals be circulated seven days after receipt, among such town members as may desire to read them. But that no one Periodical be so issued unless the said Member agree to receive it regularly for no shorter period than three months, and either forward the requisite amount of postage, or make some other convenient arrangement; otherwise the Librarian would be continually annoyed by frivolous applications, and the object contemplated by the Library would be frustrated. No member caring to obtain a particular periodical would fail to require it for less than the three months specified. Local Secretaries would find it to their great advantage to have down a sufficient number of books to furnish two to each member, in their respective localities, and to carry on an interchange of them until a fresh supply might be needed. But they must not feel hurt that single numbers of current Periodicals cannot circulate. It would be manifestly absurd to send one number of the Lancet down to Liverpool, and they can readily help themselves from local sources. There must always be some gain from a residence in town. The Committee are not responsible that London should be the Metropolis; the centre both of attraction and advantage. Else what man on the safe side of an asylum would exchange green fields and 'the liberal air' for streets and smoke?

Non cuivis homini contingit adire Corinthum.
*Οὐ παντὸς ἀνδρὸς εἰς Κόρινθον ἔσθ' ὁ πλοῦς.**

II. That the Library and its interests should be more warmly advocated in the Editorial department of the Journal. Members should now and then be reminded of its existence, and of the facility with which books may be obtained. Many country members are deterred from using the Library from an ignorance of this fact; they are deterred still more by the absence of any direct encouragement, and by never having either its operations or its value brought prominently before their eyes. The ship may be in excellent trim, but it must be steered.

III. It is desirable that some of the current Scientific Literature, such as the 'Popular Science Review,' and the 'Intellectual Observer,' should be added to the

* Dictionaries are provided in the Library.

more abstract works on pure Chemistry and Pharmacy. Such might be obtained through the medium of Lewis's Library, or in exchange for the 'Pharmaceutical Journal.' These, and all other new books or periodicals added, should be publicly mentioned in the columns of the Journal.

IV. That a permanent advertisement of the Library, its office hours, rules of circulation, and the name of its Librarian, should be formally included amongst the other official announcements of the Society on the cover of its Journal.

A Library is the infallible index of the mental status of a Society. No better warranty can be given of high intention, nobly planned and zealously carried out than the existence of a good scholarly array of books, well chosen and well kept. And while the Library stamps the character of a private dwelling-house, far more is it the outward and visible sign of the tone and purpose of an Association. Our own Society can bear the application of this crucial test, but the books want more change of air, and an occasional run into the country ; the serials also suffer from too close confinement.

These thoughts, not hastily conceived nor expressed at random, are respectfully but yet earnestly commended to those whom they may concern.

26, *St. George's Place, Hyde Park Corner.*

LOCAL EXAMINATIONS.

Sir,—If in one sense it is a secret that the Council of the Pharmaceutical Society has for some months past been considering the question of Local Examinations, it is a secret that is known to several hundreds of our members, and it would be mere affectation to ignore it because it has not been officially published. But, it may almost be said to have been published, since a circular addressed to the Local Secretaries on October 21st directed them to gather the opinions of the Pharmaceutical Chemists, and of others in their neighbourhood upon this question.

The terms in which the queries of this circular were couched might well challenge criticism, as tending to bias the replies unfavourably towards the new idea. For instance, it was asked, "Whether, the examinations remaining the same as at present," a sufficient number of candidates would present themselves. This was something like a *reductio ad absurdum*, since it implied that the provinces could do as much almost without any educational appliances of a technical character, as Bloomsbury Square was accomplishing by means of these aids. Still, the replies from all the chief towns in the country, all the towns having a population of one hundred thousand or more, were decidedly in favour of Local Examinations. Of course, these were the places immediately concerned, and their verdict was of the greatest importance.

But the discussion of the question has shown the existence of so much misunderstanding as to what is meant by the term "Local Examinations," that it is essential to define our premises before carrying the argument further. In advocating Local Examinations, I wish that we should follow the example of the English Universities and of the Society of Arts, as shown in their schemes of middle-class examinations. The success of these examinations for five or six years, has thoroughly proved the truth of the idea involved, viz. that it is possible to test the scientific knowledge of candidates upon an absolutely uniform plan, without requiring that they should attend in London.

Let us look at the result. Some thousands of young men have voluntarily passed these examinations, and given this proof of their sufficient knowledge. At the last examination held by the University of Oxford, 160 candidates passed in London, and 464 at thirteen other "centres."

Can we reasonably suppose that one-fourth of these 464 candidates would have offered themselves if compelled to attend in London? I think not. And here it is worth while noting the relative *quality* of the London and provincial candidates. Out of those examined in London 56·7 per cent. of those who presented themselves were successful; of the whole of the centres collectively 60·1 per cent. were successful; thus showing, that when tried by the same test, the provincial candidates were superior to the metropolitan.

Now, I know it may be said that these examinations are not professional examinations, and, however excellent they may be, that they are intended more as tests of the schoolmaster's work. This is not strictly so in the case of many senior candidates between the ages of fifteen and eighteen years. Examination papers are set in chemistry, and in various branches of physics, which would satisfy our board of examiners if answered by a Minor candidate. Further, the experience of the Society of Arts, and of the Department of Science and Art, both of which are holding local examinations, proves that it is possible, by a system of written papers, to test the knowledge of candidates in the following branches of knowledge:—Chemistry, botany, vegetable and animal physiology, and such departments of physics as electricity, heat, light, etc.

The machinery required to do this work is simple. The Central Board of Examiners fixes a periodical examination, to be held simultaneously at those towns where a sufficient number of candidates have offered themselves to justify the town being made a centre. In each place a delegate from the central board attends, and is met by local gentlemen who have taken the responsibility of making preliminary arrangements.

When all the candidates are present, at a given hour, the delegate opens his copy of the sealed questions which have been drawn up by the central board, and of which each delegate has a copy. It is these questions which must be answered within a given time, without any aid from books, etc. The replies are collected, marked with a distinguishing number instead of the name of the candidate, dispatched to the central board, and adjudicated upon by it. This is nothing more than our own system of prize examinations, and since we adopt it as preferable to a *vivâ voce* examination in testing the acquirements of men educated to a maximum, it is strange if it is unequal to discriminate the attainments of those making far less pretensions.

This is the sort of local examination which I feel bound to advocate as being a desideratum to the Pharmaceutical Society. Can anything be more uniform, more impartial, more feasible? To combine a personal examination, as in practical chemistry, etc., is quite easy, and is already done by the universities.

But some warm supporters of local examinations have turned their eyes in another direction, and have said—Why not have independent boards of examiners in our chief towns, in the same way that we have a board for Scotland?

I reply, because it is next to impossible to find even three towns at present prepared to furnish the material for such boards, and that this difficulty would limit the number of possible centres for the future; so much, that five-sixths of the country would be indifferent to such a scheme. But chiefly I object because of the far graver fault, that the plan would destroy all uniformity of examination.

We know how the medical profession has found its greatest difficulty in the existence of various examining bodies, and though our local boards would all be appointed by the Council, it would be impossible, in the nature of things, to attain uniformity of examination; and if we did, people would not believe so, which would be equally mischievous.

When the Oxford examinations were first founded, a number of pupils from a distance took their examinations at that city, in preference to their own "centres," having some vague idea that they would get a "more genuine

article!" The manifestly impartial nature of the plan corrected all this the second year.

There is an important question in connection with the subject, upon which I will not enlarge here, viz. the question of what status we should give to those passing such examinations? I merely wish to say that it must be a recognition that the candidate (a Senior, for instance) is *fully qualified* to perform the duties of a Pharmaceutical Chemist. We must not do less than this, or we shall be unjust, and our illiberality will defeat our object. That an examination less stringent than our present Major in some respects, would effect this, we all know.

Allow me to conclude by asking some of our members in the leading towns to give their fellow-members the advantage of a public expression of their opinions upon this important question.

I have myself refrained from this publicity until now, but the serious misunderstanding of the question which has arisen from its having been so slightly brought before the body, has made me regard it as a duty to offer these explations, with a view to clearing up some misconceptions.

I am, Sir, yours truly,

Leeds, December 22, 1863. R. Reynolds.

INFUSUM CINCHONÆ SPISSATUM.

Having lately had a considerable demand for this comparatively little-known preparation of cinchona, we have tried a few modifications of the process of the London Pharmacopœia, which, in our opinion, produce a liquor containing a larger proportion of the active principles of the bark, and yield a preparation much superior, to that obtained by a strictly pharmacopical method. In the first place, with regard to the degree of comminution to which the bark should be reduced, the Pharmacopœia directs that it should be employed in a coarse powder, which is certainly rather an indefinite term; we have, however, with great advantage used a uniform powder produced by passing it through a sieve of about fifty meshes to the inch; it is then mixed with distilled water (which should always be employed on account of the salts of lime ordinarily present in common water, which form a serious objection when the degree of concentration is taken into consideration) until formed into a paste after twenty-four hours' digestion, during which time the greater part of the moisture is absorbed; more water is added, until there is sufficient to completely cover the bark to the depth of an inch; in this state it is allowed to remain for four days at a temperature of 55° to 60°, and stirred thoroughly at intervals; at the expiration of this time the liquor is strained off, the residue strongly pressed, more water is then added and macerated for two days, pressed, finally macerated again for the same period, and subjected to powerful pressure; the mixed liquors are then evaporated over a bath at a temperature of 170° until reduced to a specific gravity of about 1·200: the setting aside of the liquors when partially evaporated to deposit the dregs, seems to be of very little importance or advantage, as we have found but a very trifling deposit in the liquor obtained by the above process. It will be seen that this mode of preparation occupies a period almost three times that of the Pharmacopœia, and judging by the result, the length of maceration seems to be no greater than is absolutely required for the water to thoroughly permeate the woody fibres of the bark, and render it sufficiently soft to be influenced by the pressure to which it is subjected. The infusion we have noticed does not appear to require more than fourteen days for the dregs to subside, as it is generally perfectly bright even at the expiration of a week, but a longer time renders it less likely to deposit when bottled; the specific gravity of the liquor when reduced to the strength of one drachm, equivalent to

one ounce of bark, is generally about 1·150, although, of course, varying slightly according to the quality of bark employed.

BREW AND COMPANY.

71, *East Street, Brighton.*

LIQUOR BISMUTHI.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Gentlemen,—In the course of the discussion which followed the paper upon "Liquor Bismuthi," at the last evening meeting of the Society, Dr. Attfield stated a communication had been published several years ago in the Journal of the Chemical Society, by Mr. Spiller, in which the facts upon which the chemistry of the solution depended had been announced. Five minutes before I had claimed the credit of their discovery for myself, and the statement of Dr. Attfield must have appeared to many to render that claim somewhat doubtful. Mr. Attfield has since then kindly referred me to the volume and page containing Mr. Spiller's paper, and I see it is dated July, 1857. My preparation was already being used early in 1855; the first written order for it I can now find is from the Bristol General Hospital, and bears the date March, 1855. I have no doubt, therefore, the experiments which resulted in "Liquor Bismuthi (Schacht)" were concluded at least two years and a half before the publication of Mr. Spiller's paper.

I am, Gentlemen, your obedient servant,

Clifton, December 8, 1863. G. F. SCHACHT.

NOTE ON INSECT-WAX OF CHINA.

Mr. Reynolds wishes to make a correction in connection with his paper upon Bees'-Wax, in our December number.

In speaking of varieties of wax, he named briefly insect-wax of China, stating that "it resembles good block white wax. The price is about 2*s.* 8*d.* per lb."

His authority for this account was a paper by Mr. B. S. Proctor, on "Substitutes for Wax" (Chem. and Drug., August, 1863), which stated that a sample answering this description had been furnished by Messrs. Hodgkinson, Tonge, and Stead, of London. Mr. R. accepted this definite statement as reliable, although his own attempts to meet with China insect-wax in the hands of wholesale druggists were unsuccessful. It now appears that some error has occurred in the sample sent to Mr. Proctor, who has forwarded a portion of it to Mr. R. for examination. When thirty grains are digested in ether, it leaves thirteen grains of insoluble residue, a quantity corresponding with black Japan-wax. The true China insect-wax is very little affected by ether, and its appearance is almost identical with that of spermaceti.

This result with ether confirms the opinion formed from a physical examination, viz. that Mr. Proctor's sample is Japan vegetable wax, an opinion in which Mr. Hanbury coincides. Since Japan wax has often been sold under the name of "China Wax," the mistake is not surprising; and it should also be noted that Mr. Proctor's account of the properties of the wax as found by him agrees perfectly with those of Japan wax, and in speaking of the different melting-point which he observed to that given by Miller, he says, "So great a discrepancy as indicated above, for China wax, must surely be the result of a difference in the nature of the sample."

SCIENCE *versus* SPIRITS.

The notice which has appeared under the above heading has led many persons to imagine that Mr. Manning's optical illusions are publicly exhibited, and Messrs. Car-

penter and Westley have received many applications from the curious for a peep. We are enabled to state that this new adaptation of Mr. Dircks's discovery does not pretend to rival the celebrated "Ghost," but that it exhibits many startling effects which have not been shown in public, and have only been seen by Messrs. Carpenter and Westley's personal friends. The exhibition is strictly private.

REVIEW.

De la Pharmacie. Par M. Fumouze, Pharmacien, Président honoraire de la Société de Prévoyance. Paris. 1863.

This little work, which to some extent is a reprint from articles which have already appeared in "La France Médicale et Pharmaceutique," is an historical survey of pharmacy, tracing the successive stages from its rise, to its final establishment as a recognized trade science. It is always interesting to study either the failure or success of systems not our own, for thus we may learn to estimate rightly both our weakness and our strength. The style of this unpretending volume is singularly clear, nor is it disfigured by that affectation of short and startling sentences which has pervaded modern French literature since the date of Victor Hugo.

In April 11, 1803, Pharmacy was definitely created a branch of Government education; three schools were established, one at Paris, the second at Montpellier, and the third at Strasburg. Several of the provisions of the Act being open to objection, a new decree, bearing date August 21, 1854, became the basis of the organization which more or less prevails at present. There are three distinct systems of pharmacy, each having undoubted advantages of its own.

1. English pharmacy, the type of absolute free trade. "En Angleterre, le premier venu, savant ou illettré, peut ouvrir boutique de médicaments, préparer et vendre des remèdes simples et composés, exécuter sous sa responsabilité les ordonnances du corps médical." [In England, whoever likes, learned or otherwise, may open a physic shop, prepare and sell simple and compound remedies, and make up the prescriptions of medical men on his own responsibility.] He may sell what best he chooses and be a codex to himself. There are nevertheless some true pharmaceutists who do not take the license which the law permits.

2. The Northern system, the type of the extreme exclusive. To Prussia may be assigned the honour of its creation, and it is now followed by the whole of Germany and even in Russia, although with certain modifications adapted to each State. The pharmaceutist is here a sort of Government officer, his number is limited precisely in the same manner as the notaries in France. The whole body of pharmaceutists is admirably well instructed, and a rigid course of examination is adopted in order to obtain the requisite diploma, without which no one is allowed to practise pharmacy. The sale of general articles is forbidden; the price of drugs and remedies is fixed by law, though pharmaceutists may sell *under* the published tariff, on condition of such price being conspicuously marked upon the label. In Russia there are only from 700 to 800 pharmaceutical establishments; St. Petersburg with 500,000 inhabitants boasts only forty-one.

3. The French system, which is a mixture of these two. On the one hand there is no limitation of number nor Government tariff; on the other, a course of scientific study is essential, and the trade in sundries is forbidden. The author is of opinion that the English system of liberty, carefully restricted to those working under the sanction of a diploma, is the best, not only for the interest of the pharmaceutist but also for the safety of the public.

But as no change can be effected without some definite proposition, M. Fumouze gives the following summary of an amended legislation:—1. Fusion of the three head schools of pharmacy with the three schools of medicine. 2. The title of doctor of pharmacy to be awarded to pharmaceutists received in the three superior schools, and that of pharmaceutist only to those who have passed the preparatory schools. 3. The right of commencing business anywhere in France. 4. Certain medicines to be delivered to the public without a prescription from the physician. 5. The right of preparing and vending

remedies other than those included in the codex. 6. The abolition of the Poison Bill as far as relates to pharmacy. Much of this system is already practically carried out; the first proposal is untenable, fusion between pharmacy and medicine cannot be. No; the field of pharmacy is wide enough to make it a life-study in itself. Keep the two schools separate, if only from prudential motives, else the student may be tempted to neglect his pharmacy, which is one evil, and to acquire a smattering of medicine, which is another. The writer of these lines is not too old to recollect with vivid distinctness the prestige of the École de Médecine, and the extreme popularity of its lectures; all the more striking from the contrast of the still life exhibited at the École de Pharmacie. Moreover pharmacy is a trade, and must remain so if by its means we expect to gain a living. Do not therefore needlessly distract the student's mind. There is already quite enough temptation offered to despise the apron, and exalt the cap and gown.

He would be a bold man who would venture unaided to stretch the outline of a Poison Bill that should meet all possible exigencies and be open to no appreciable fault; but even the most cautious might venture to express the thought that French enactments might be less vexatious, and at the same time more effective. One illustration given by M. Fumouze in his appendix will be sufficient proof. A wretched woman, living in the suburbs of Paris, was bent on the destruction of her husband. Her method was satanic in its skill, and consisted in the daily administration of small doses of tartar emetic, until death ensued. An able physician attributed the decease to inflammation, but was of opinion that it was no criminal case, since many non-poisonous substances might have produced the same effect. However, two analysts declared that there had been poisoning, slow but sure. The woman was condemned. During the prosecution it transpired that every variety of artifice had been adopted to procure minute quantities of emetic from different pharmaceutists. The order, being beneath notice, had not been entered in the usual manner in the book kept specially for that purpose. In most cases there was no record of the transaction. The whole of the pharmaceutists who either themselves or by their assistants had been concerned were subsequently tried on the charge of having sold a poisonous substance without duly conforming with the regulations, and they were fined accordingly; from which we may draw the moral that the strict letter of the law may be twisted into folly when not interpreted by common sense.

In consequence of the Act which forbids the practice of pharmacy without diploma, a class of men has arisen in France who lend themselves, together with the sanction of their title, to such houses as may require their aid. These persons are called Prête-Noms. The system is obviously open to abuse, and is not held in much esteem. The chapter describing this peculiar institution will well repay perusal, the case with its evils and advantages being most fully stated. It should be borne in mind that this system of "lent-names" is by no means limited to pharmacy. Its worst and most objectionable development is in the case of certain provincial hospitals, which, under the guise of religious charity, trade in medicines. Current French medical literature bears frequent witness against this deplorable abuse, which could not exist save through the agency of some pharmaceutist with a recognized certificate. A hospital so constituted is the despair of the neighbouring pharmaceutist, nor can it be doubted that when religion hawks physic the interests of both worlds are at stake.

The two concluding chapters are devoted to the consideration of specialities, and the value of advertisement. It is contended that every pharmaceutist would find it to his interest to pay *special* attention to one or more preparations; that in so doing his long practical experience would naturally indicate the best and most reliable methods, while the public, once satisfied with the result, would be glad to find the identical speciality in all parts of the world. Blancard's pills of iodide of iron, and Henry's magnesia, may be taken as examples of the author's meaning. The question of advertisement is redolent with gunpowder, and must be handled with the greatest caution. M. Fumouze is strongly in its favour, and we cannot deny that from the trade point the subject is fairly argued. It is a hard matter to decide to what extent professional reputation may be injured or advantaged by resort to mere trade expedients. One thing is certain, that the views enunciated by M. Fumouze will find energetic advocates on this side the Channel.

CAUTION.

Mr. T. Fardon (Maidstone) wishes to caution our readers against a man who is calling on the trade generally, and offering an article called "Robinson's Poison for rats, mice, etc." "His practice is to ask payment for half only of the goods he leaves with the purchaser, the remainder to be paid for on his *next* journey. He shows cards from Druggists who have been fleeced by him; he also solicits an address card, that he may put it into the hands of the publisher of the local paper, in which he promises to insert an advertisement." Mr. Fardon states that he believes the powder to be extremely *fattening*, as the mice appear to thrive rapidly on it.

BOOKS RECEIVED.

FIRST OUTLINES OF A DICTIONARY OF THE SOLUBILITIES OF CHEMICAL SUBSTANCES. By FRANK H. STORER. One Volume, in Three Parts.—Part II. Cambridge: Sever and Francis. 1863.

A SYSTEM OF INSTRUCTION IN QUALITATIVE CHEMICAL ANALYSIS. By DR. C. REMIGIUS FRESENIUS. Sixth Edition. Edited by J. LLOYD BULLOCK, F.C.S. London: John Churchill and Sons, New Burlington Street. 1864.

TO CORRESPONDENTS.

An Apprentice (Bristol).—No time has been announced, but it is not probable that it can be prepared for publication for some months after the issue of the new British Pharmacopœia.

Pharmaceutist (London).—Apply to the Secretary, 17, Bloomsbury Square.

Inquirer (Birmingham).—A paper on the subject will be published shortly in Professor Bentley's series on "New American Remedies."

Cupidus.—Read 'Selecta è Prescriptis,' Fownes's 'Manual of Chemistry,' and Bentley's 'Manual of Botany,' and apply to the Secretary, 17, Bloomsbury Square, for further information.

Leptandra virginica.—A paper on this subject will be shortly published amongst the "New American Remedies."

M. P. S. (Whitechapel).—We can offer no advice with regard to "window decoration." An esteemed contemporary has recommended a good model of a leg wearing an elastic stocking; though we doubt the propriety of putting pharmacy on that footing, possibly such an ornament might prove effective in your neighbourhood.

"*Chemicus.*"—(1) The article sold as *extract of limes* is composed of equal parts of liquor calcis and oleum amygdalæ, scented with essence of lemon. (2) Vol. XIV. p. 207.

"*Vulnus*" (Market Drayton).—1. *Wound stone*, the same as *lapis divinus*, which is composed of sulphate of copper, nitrate of potash, and alum, of each ℥iij, camphor ℥i. The three first ingredients are fused together in a crucible, the camphor being added at the end of the process. Our correspondent wishes for a form for *waterproof varnish for patent leather*.

D. E. I. (Llangollen).—It is quite a matter of taste; probably the following would answer the purpose:—Essence of bergamot, two drachms; otto of rose, six drops, to one pint of the oil.

"*Tyro*" (Wilton).—We believe the chalk having the appearance described, is prepared by dropping it when in a semi-fluid state, on some porous material, which absorbs the water, and leaves the chalk in a conical form.

H. C. (Islington).—By means of nitric acid.

J. Y.—The quantity of sulphuric acid directed to be used in making bipersulphate of mercury is more than theoretically required, so that there may be sufficient present to compensate for loss by evaporation, and to prevent the formation of a lower compound.

Several communications are unavoidably deferred until next month.

Instructions from Members and Associates respecting the transmission of the Journal before the 25th of the month, to ELIAS BREMRIDGE, Secretary, 17, Bloomsbury Square, W.C.

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. V.—No. VIII.—FEBRUARY 1st, 1864.

THE BRITISH PHARMACOPŒIA.

This long-looked-for work has at last appeared, and will, no doubt, be in the hands of many of our readers before this notice is read; for although, at the present moment, the supply of the work is very inadequate to the demand,—some of our friends being anxiously seeking in vain for copies,—yet this restricted issue will of course be of short duration, and in a few days or weeks the 'British Pharmacopœia' of 1864 will supersede its predecessors, and take its place in the medical and pharmaceutical establishments throughout the country. No Pharmacopœia, probably, has ever been looked for with so much interest as this, or with such various anticipations of the extent to which it will fulfil the requirements of the profession, and contribute to place the practice of British pharmacy in the advanced position it ought to occupy.

Of the two forms in which the work is to appear, the larger, or octavo volume, is that alone which is at present being published. It is a book of 444 pages, and its appearance is decidedly in its favour; it is well printed, in clear, distinct, and appropriate type, and on good paper. With the exception of the names of medicines, both simple and compound, which, in the headings to the several articles, are given in Latin as well as English, the whole of the work is in English; and this is the first time an English Pharmacopœia has emanated from the London College of Physicians, although the Edinburgh and Dublin Pharmacopœias have previously appeared in that language. The Latin names are given for the use of prescribers, as there are special reasons for continuing the use of such rather than English names in medical prescriptions, but all the information given with reference to the substances named, is expressed in the language best known to those for whose use the book is intended.

A Pharmacopœia is a medium of communication between the prescribers and dispensers of medicines, an authorized exponent of the value and meaning of the terms employed in extemporaneous prescriptions. The physician describes here the medicines he proposes to use in the treatment of disease, and the description should be such as clearly to define every drug and medicine referred to, with such instructions as will enable those to whom the preparation of medicines is entrusted to provide the prescribed remedies in the state in which they are intended to be used. The 'Pharmacopœia' is a work of constant reference by medical prescribers and pharmaceutical manufacturers and dispensers; it has to be daily used by thousands of men of different capacities and qualifications, ranging from the learned physician to the half-educated druggist's apprentice, or laboratory assistant, and upon the right interpretation of its instructions, or the accomplishment of its objects, may often depend the issue

of the contest between medical treatment and disease. Its language should be simple and explicit, and the arrangement of the matter such as to afford the greatest facilities for reference. With nothing superfluous, it should nevertheless contain ample details suited to the requirements of those by whom medicines are to be prepared. While every attainable quality that will contribute to the efficacy of the medicines should, as far as possible, be provided for, no unnecessary difficulties should be thrown in the way of manufacturers or dispensers. Merely fanciful qualities, difficult of attainment, degrees of purity which cannot be uniformly ensured, or which, if they can, would occasion an increase of expense, unwarranted by any difference in the power or properties of the medicine, should not be required. The 'Pharmacopœia,' in fact, should be a book that he who runs can read, and he who reads can follow.

There are many practical difficulties in the way of producing a good Pharmacopœia. To determine what substances should be included in the Materia Medica requires the knowledge and experience of the physician. To give to these the most suitable condition for medical administration, and to combine them so as to produce the required effect, involves the conjoint knowledge of prescriber, manufacturer, and dispenser. To devise the best means of eliminating active principles, or producing definite compounds, suitable for use in medicine, requires the scientific knowledge and skill of the chemist. To indicate the characters by which the substances used in medicine may be distinguished and identified, the habits of observation and powers of discrimination of the naturalist must be applied. There are thus required a combination of powers that are rarely possessed by one person, and are not easily associated in different individuals so as to produce the required result. Since physicians have given up the practice of pharmacy, they have ceased to possess the knowledge that would enable them to indicate the best forms for the administration, and processes for the production, of medicines. On these points they must appeal to the practical pharmaceutist and manufacturing chemist; nor could these latter accomplish the object without the aid of the physician, who watches and judges of the effects of the medicines.

In the preparation of the 'British Pharmacopœia' there has been engaged an unusual combination of associated talent, from which some persons have been led to expect a work greatly superior to any similar work previously produced. But if in some respects the Committee, to whom the work has been entrusted, have been favourably circumstanced, in others they have laboured under great disadvantages. They have had to amalgamate three separate Pharmacopœias, and to reconcile to one standard the practice of medical men, who, as they have been differently situated and circumstanced, have hitherto had three separate standards. Each of the three previously existing Pharmacopœias has had its representatives, and may be supposed to have had its advocates. These representatives in England, Scotland, and Ireland have been too far removed from each other to admit of their working thoroughly in concert, yet their concurrence in results has been necessary, and this has, no doubt, involved many compromises likely to be unfavourable in their influence upon the character of the work. The predictions of success in the first edition of the 'British Pharmacopœia' have not been unaccompanied by serious misgivings on the part of many observant men. The work, however, is now before the public, and will be fairly judged upon its merits.

The time does not admit in the present number, which is now preparing for press, of our entering very fully into a critical examination of a work of this description, involving so many points on which its merits must depend. As far as we have looked into the work, and can judge at first sight, we find much to commend, and much also that is wholly indefensible.

We propose, in the first place, to point out some of the most prominent

changes which will be effected in the practice of pharmacy by the operation of the 'British Pharmacopœia.'

Weights and Measures.—Our readers are already aware—for it has long been publicly known—that the avoirdupois ounce and pound are to supersede the troy weights of those denominations in pharmacy, while the troy grain is still to be retained, and the scruple and drachm to be abolished. The measures will remain as heretofore, but not their symbols.

"The weights and measures of the 'British Pharmacopœia,' with their symbols, will now stand as follows:—

WEIGHTS.

1 pound	lb. =	16 ounces	7000 grains
1 ounce	oz. =	....	437·5 grains
1 grain	gr. =	....	1 grain

MEASURES.

1 gallon............	C ...... =	8 pints	O viij
1 pint	O ...... =	20 fluid ounces	fl. oz. XX
1 fluid ounce......	fl. oz.... =	8 fluid drachms......	fl. drs. viij
1 fluid drachm ...	fl. drm. =	60 minims	min. LX
1 minim...........	min. ... =	1 minim...............	min. j."

If it had been proposed that these weights and measures, with their symbols, should be used in the 'British Pharmacopœia,' and their use extend no further, the change would, no doubt, have been submitted to without a murmur; but when prescribers and dispensers are enjoined to adopt this system, and to discontinue the use of the drachm and scruple weights, we predict that the change will not be effected without some opposition. The new system of weights appears to us to be inconvenient, and the symbols for both weights and measures by no means so convenient or explicit as those hitherto used. The drachm and scruple, with their well-known characteristic symbols, which are so easily written and distinguished, and the values of which form such convenient integers in extemporaneous prescriptions, cannot surely be superseded by the grain for representing quantities up to 437·5 grains. But not only are the drachm and scruple, with their symbols, to be abolished, but the symbol for the apothecaries' ounce (℥) is also to be discarded, and the new ounce is to have the much less easily written and distinguished symbol, oz. These changes, which we were prepared for, are bad enough; but we certainly were not prepared for the change to be made in the mode of representing the measures. What have the symbols for the fluid ounce and drachm done to offend the Medical Council, and to cause them to be abolished with the drachm and scruple weights? The fluid ounce is in future to be written fl. oz., and the fluid drachm, fl. drm.

Chemical Nomenclature.—There are some changes in the names of chemical compounds which are deserving of particular notice. The scientific names applied to calomel and corrosive sublimate have been changed with almost every new edition of the 'Pharmacopœia,' to reconcile them to the altered views or prevailing practices of scientific chemists. Thus calomel, which in 1721 and 1746 was called "*Mercurius dulcis sublimatus*," in 1788 was changed to "*Hydrargyrus muriatus mitis*," in 1809 to "*Hydrargyri submurias*," and in 1836 to "*Hydrargyri chloridum*." We have now another change. In the 'British Pharmacopœia' calomel is called calomel, its Latin name being "*calomelas*," but it is also called "*Hydrargyri subchloridum;*" and corrosive sublimate, which is latinized into "*Hydrargyrum corrosivum sublimatum*," is designated "*chloride of mercury*," the name formerly given to calomel. Red precipitate is now "*Hydrargyri oxidum rubrum*," and iodide of mercury "*Hydrargyri iodidum viride*."

Aconitine is changed to "*Aconitia;*" emetic tartar is called "*Antimonium tartaratum, Tartarated antimony;*" black sulphuret of antimony is "*Antimonium sulphuratum, Sulphurated antimony;*" nitrate of bismuth is "*Bismuthum album, White bismuth;*" Calx chlorinata is now "*Calx chlorata,* the English *chlorinated lime* being retained; chloroformyl is changed to "*Chloroformum;*" potassio-tartrate of iron is now "*Ferrum tartaratum, Tartarated iron;*" white precipitate is "*Hydrargyrum ammoniatum, Ammoniated mercury;*" *Plumbi oxidum* is changed to "*Lithargyrum, Litharge;*" *Potassii sulphuretum* is changed to "*Potassæ sulphurata, Sulphurated potash;*" *Potassæ bitartras* is changed to "*Potassæ tartras acida, Acid tartrate of potash;*" *Quinæ disulphas* is now "*Quiniæ sulphas.*"

The most important of these changes are those made in the chlorides of mercury. The name by which medical men have been accustomed to prescribe, and chemists to dispense calomel, no longer applies to the mild mercurial which has been used in five-grain doses to stimulate the liver, but is a name now given to the poisonous corrosive sublimate which destroys life in such or even smaller doses.

Chemical Notation.—We have now for the first time introduced into the 'Pharmacopœia' the method adopted by scientific chemists of representing the composition of chemical compounds by the use of symbolical formulæ. Thus glacial acetic acid is represented by $HO, C_4H_3O_3$, nitric acid by $3HO, 2NO_5$, etc. This method of representing chemical substances is often of great use. It serves to define bodies more precisely than can usually be done by any short and simple verbal description. Thus the above formula for acetic acid represents it as a perfectly definite compound of one atom, or fifty-one parts by weight, of anhydrous acetic acid, and one atom, or nine parts by weight, of water. The body represented by the formula must consist of those ingredients in precisely those proportions and no others, whereas the name *glacial acetic acid* admits of slight variations in the proportion of water, and is applied to acetic acid which is strong enough to crystallize in cold weather. The objection to the use of the formula in such a case is that it has too precise a signification. The substances used in medicine are not generally required to be in a state of chemical purity, or in such a perfectly definite state as symbolical formulæ would represent. Some chemical bodies, it is true, assume such a state by crystallization or other means in process of manufacture, and when they do so, they are of course by preference used in such a state; but it is often difficult to get bodies, especially those that do not crystallize, in the state that would be represented by a chemical formula, and if required, they could only be produced at a greatly augmented price, while no advantage whatever would result in their use in medicine. It is only necessary to refer to a few of the instances in which these formulæ are used in the British Pharmacopœia to show the difficulties and inconsistencies their employment leads to. Thus with regard to *glacial acetic acid*, the product obtained by the process given in the Pharmacopœia will not accord with the formula. Indeed we may go further, and say that the process, strictly followed, will not yield glacial acid at all. If the use of glacial acid answering to suitable tests had been required, all difficulty would have been avoided, and the requirements of the case sufficiently fulfilled. The manufacturer, who best knows how to produce it, would furnish glacial acetic acid as near to the state of a monohydrate, and as free from impurities as it can practically be obtained by any process that would not unduly augment its cost. Again in the case of nitric acid, the formula given represents an acid consisting of two atoms of anhydrous nitric acid, and three atoms of water, which is a colourless liquid, but the product obtained by the process given, and also the verbal description of the product which is appended to the formula, differ materially from the body represented by the formula. We may also refer to the article on *nitrite of soda*, in the

appendix, for a striking instance of the misapplication of a symbolical formula. A process is given for making nitrite of soda to be used in the preparation of spirit of nitrous ether, and the resulting salt is represented by the formula NaO, NO_3. The objection is that the nitrite of soda will form only a small portion of the product formed by the process, and that therefore the formula is wholly inapplicable.

Preparations contained in previous Pharmacopœias, but rejected from the 'British Pharmacopœia.'—The following list, if not quite complete, comprises at least the principal part, and the most important, of the rejected preparations, not including the raw drugs, which are referred to in a separate article at page 358.

Acetum Britannicum.
——— Cantharidis.
——— Colchici.
——— Destillatum.
——— Opii.
——— Scillæ.
Acidum Aceticum Camphoratum.
——— Nitromuriaticum.
Ammoniæ Bicarbonas.
Aqua Anisi.
—— Cassiæ.
—— Potassæ effervescens.
—— Pulegii.
—— Sodæ Effervescens.
Atropiæ Sulphas.
Calamina Præparata.
Ceratum Calaminæ, and all the cerates.
Confectio Aurantii.
——— Cassiæ.
——— Catechu composita.
——— Opii.
——— Rutæ.
Cupri Ammonio-sulphas.
Decoctum Amyli.
——— Chimaphilæ.
——— Cydonii.
——— Dulcamaræ.
——— Gallæ.
——— Guaiaci.
——— Lini Compositum.
——— Mezerei.
——— Myrrhæ.
——— Senegæ.
——— Tormentillæ.
——— Ulmi.
——— Uvæ-ursi.
Emplastrum Ammoniaci.
——— Assafœtidæ.
——— Cumini.
——— Potassii Iodidi.
Essentia Anisi, and all the essences.
Extractum Colocynthidis.
——— Digitalis.
——— Lactucæ.
——— Papaveris.
——— Pareiræ.
——— Uvæ-ursi.
Ferri Ammonio-chloridum.
Ferri Valerianas.
Hydrargyri Bisulphuretum.
Hydrargyrum cum Magnesia.
Infusum Armoraciæ Compositum.
——— Juniperi.
——— Menthæ viridis.
——— Pareiræ.
——— Simarubæ.
Iodidum Sulphuris.
Linimentum Æruginis.
Liquor Aluminis Compositus.
——— Ammoniæ Citratis.
——— Arsenici Chloridi.
——— Hydrargyri Bichloridi.
——— Arsenici et Hydrargyri Hydriodatis.
——— Morphiæ Acetatis.
——— Zinci Chloridi.
Mel Rosæ.
Mistura Gentianæ Composita.
——— Spiritus Vini Gallici.
Morphiæ Acetas.
Oleum Æthereum.
Oxymel Scillæ.
Pilula Conii Composita.
——— Cupri Ammoniata.
——— Digitalis et Scillæ.
——— Ferri Sulphatis.
——— Ipecacuanhæ et Opii.
——— Ipecacuanhæ cum Scilla.
Plumbi Iodidum.
——— Nitras.
——— Oxidum Rubrum.
Pulvis Aluminis Compositus.
Quinæ Murias.
——— Valerianas.
Sodæ Sulphas.
Spiritus Ætheris Compositus.
——— Ammoniæ.
——— Anisi.
——— Carui.
——— Cassiæ.
——— Cinnamomi.
——— Menthæ viridis.
——— Pimentæ.
——— Pulegii.
——— Vini Gallici.
Strychniæ Murias.
Syrupus Aceti.

Syrupus Acidi Citrici.
——— Althææ.
——— Cocci.
——— Croci.
——— Ipecacuanhæ.
——— Morphiæ Acetatis.
————— Muriatis.
——— Rhamni.
——— Sarsæ.
——— Violæ.
Tinctura Cardamomi.
——— Cassiæ.
——— Castorei Ammoniata.
——— Cubebæ.
——— Cuspariæ.
——— Ferri Ammonio-chloridi.
——— Guaiaci.
——— Hellebori.
——— Lactucarii.
——— Matico.
Tinctura Opii Ammoniata.
——— Quassiæ.
Trochisci Acaciæ.
——— Acidi Tartarici.
——— Cretæ.
——— Glycyrrhizæ.
——— Lactucarii.
——— Magnesiæ.
——— Sodæ Bicarbonatis.
Unguentum Æruginis.
——— Conii.
——— Opii.
——— Picis.
——— Picis liquidæ.
——— Plumbi Iodidi.
——— Sambuci.
Vinum Gentianæ.
——— Rhei.
——— Tabaci.
——— Veratri.

Preparations not contained in the previous Pharmacopœias, but inserted in the 'British Pharmacopœia.' Those articles only are included in this list that are not contained in the London, Edinburgh, or Dublin Pharmacopœias.

Acidum Nitro-hydrochloricum dilutum.
——— Sulphurosum.
Ammoniæ Benzoas.
——— Phosphas.
Antimonii Terchloridi liquor.
Beberiæ Sulphas.
Collodium.
Digitalinum.
Enema Magnesiæ Sulphatis.
Extractum Calumbæ.
——— Colocynthidis compositum.
——— Belæ liquidum.
——— Ergotæ liquidum.
——— Filicis liquidum.
——— Opii liquidum.
——— Pareiræ liquidum.
Fel Bovinum purificatum.
Ferri et Quiniæ Citras.
——— Perchloridi liquor.
——— Pernitratis liquor.
Hydrargyri Nitratis liquor acidus.
Infusum Cusso.
——— Dulcamaræ.
——— Senegæ.
——— Uvæ-ursi.
Linimentum Aconiti.
——— Belladonnæ.
——— Chloroformi.
——— Iodi.
——— Terebinthinæ Aceticum.
Liquor Atropiæ.
——— Potassæ Permanganatis.
——— Sodæ Arseniatis.
Liquor Strychniæ.
Lithiæ Carbonas.
Lithiæ Citras.
Pilula Aloes Barbadensis.
——— Ferri Iodidi.
Podophylli Resina.
Potassæ Citras.
——— Permanganas.
Potassii Bromidum.
Resina Jalapæ.
——— Scammoniæ.
Santoninum.
Scammoniæ Resina.
Soda Caustica.
Sodæ Arsenias.
Spiritus Cajuputi.
——— Chloroformi.
——— Pyroxylicus Rectificatus.
Succus Conii.
——— Scoparii.
——— Taraxaci.
Suppositoria Acidi Tannici.
——— Morphiæ.
Syrupus Aurantii floris.
Tinctura Arnicæ.
——— Conii Fructus.
——— Sabinæ.
——— Senegæ.
Trochisci Acidi Tannici.
——— Bismuthi.
——— Catechu.
Unguentum Aconitiæ.
——— Atropiæ.
——— Calomelanos.
——— Terebinthinæ.
——— Veratriæ.

Arrangement of the Matter.—Although the plan adopted in the arrangement of the matter is ostensibly similar to that of the previous Pharmacopœias, yet it differs to some extent, and the difference, we think, does not tend to the advantage of the new work. The preface states that "it was resolved that the 'British Pharmacopœia' should consist of two parts and an appendix; the first part to consist of the Materia Medica, the second of the preparations and compounds, and the appendix of articles which are employed for the chemical processes in the second part, but are not themselves used in medical practice, and of preparations solely intended for the chemical examination of the articles contained in the first and second parts."

The previous Pharmacopœias of London, Edinburgh, and Dublin were arranged on a similar plan to this, as far as relates to the first and second parts, but there is a great difference between those works and the present in the mode of carrying out the plan. In the London Pharmacopœia of 1851, for instance, the two parts contain different articles, and the same article is in no instance described in both parts. The first part contains all the articles for the preparation of which no processes are given, and the second part gives processes for the preparation of the articles not described in the first part. The two parts are thus perfectly distinct, and relate to different substances. If an article is described in the Materia Medica part, all that is said about it will be found there; and so also with reference to any article among the preparations, having found the place in which it is described, all that it was thought necessary to say about it will be found there.

In the 'British Pharmacopœia,' however, it is quite otherwise. Some articles are described exclusively in the first part and some exclusively in the second part, but many are described in both, so that there is a process given in one part of the book for the production of an article, while the description of the product is contained in another part. This is calculated to cause confusion, and by separating the description of a product from the description of the process for producing it, the operator is less likely to attend to the former than he would be if both were placed together. The plan adopted causes an unnecessary augmentation in the size of the book, and much unnecessary trouble in turning from one part to another to find the information required; moreover, from the peculiar method adopted in carrying the plan into effect, the difficulty of finding what is wanted is greatly increased, as the same substance is described in one part under a different name from that under which it is given in the other part. Thus, for instance, if the operator is making *Spiritus Ætheris Nitrosi*, he finds the process under that title in the alphabetical arrangement of the part of the book relating to "Preparations and Compounds," and when he has got his product and wants to know whether it agrees with the description and answers to the tests, he has to turn to the Materia Medica part of the book, which is also arranged alphabetically; but he will not find it there under the same name, although he may at last discover it under the name of *Ætheris Nitrosi Spiritus*. Discrepancies of this description occur in other similar cases, and cannot fail to cause much confusion; in fact, whatever may be the merits of the work, we cannot include that of its being easy of reference.

Having thus sketched the general characters of the work, we must defer the more particular examination of the matter until a future occasion.

THE PROPOSED MEDICAL BILL AFFECTING PHARMACY.

As the Session of Parliament approaches, the excitement amongst chemists and druggists with reference to the proposed Medical Bill increases on every

hand,—an excitement of which the Pharmaceutical Society are not likely to be unmoved or indifferent spectators.

The chief ground for alarm is, of course, the circumstance that no provision appears in the present draft of the Bill for the protection of those who are already in business; but it must be remembered that the present is but the draft of the proposed measure, put forth for the consideration, as it is stated, of the Medical Council when it shall meet, subject to many additions and alterations, and concerning all the provisions of which the framers declared they were not themselves fully agreed. The Legislature will never pass a measure which shall disregard the just claims of existing interests, and any attempt to do so would meet with the strenuous opposition of the Council of the Pharmaceutical Society.

If indeed their own members were all that the Council cared to protect, they might dismiss all alarm about the matter,—they at any rate are safe; and it is only because the Pharmaceutical Society are ever ready to take charge of the interests of all, whether members or not, as they did in the case of the Poison Bills, that they need much concern themselves about it. At the same time they must remind the trade generally of that which has always happened before,—that there is very great difficulty in seeking to preserve the interests of those who are at present in business, from the impossibility of giving any legal definition of what a chemist and druggist is. Is he one who deals in drugs and chemicals? Then every grocer, oilman, chandler-shop-keeper, etc., who sells Epsom salts, sulphur, etc. etc., may claim under the Act to be registered and declared by the Government to be a fit person to compound medicines. Will the Legislature ever sanction this? And what will those say about it who are continually declaring it to be the duty of the Pharmaceutical Society to strive for a law to prevent any but a chemist from selling drugs, etc., when the register will at once give such men an equal right with themselves? Suppose it is said that none who have not served an apprenticeship shall be registered, the question again recurs, an apprenticeship to whom? To any dealer in drugs and chemicals? Then every apprentice to a grocer, oilman, painter, chandler-shop-keeper, or any one else whose master sold these things may claim to be put upon the register, as a person qualified (if he be in business at the passing of the Act) to make up prescriptions and stand by the side of the educated chemist and druggist. And if there be a demand on the part of the public that their lives and health should be protected from men utterly incompetent, is the Legislature likely to perpetuate by that registration the very mischief complained of until the present generation of shopkeepers have passed away? These things have led every framer of Bills concerning Pharmacy to maintain that there was no way but examination of those already in business, to separate those who should be protected from those who did not deserve it. Whether these views will still sway the Legislature it is impossible to tell, but all that the Pharmaceutical Society can do for the interests of all, they will do, as they ever have done.

It is true that the Council might, without injustice, hold other language. They might say to a very large number of those who call loudly for the aid of the Society:—"Were you not warned over and over again that occasions of this sort would arise; and were you not repeatedly offered ten years ago free admission into the Society without examination, and perfect equality with all who belonged to it; and were not warnings and exhortations in vain? Did you ever aid the Society with a shilling of your money? Have you not rather taken every opportunity to disparage it? and have you not dissuaded your assistants and apprentices from joining it when they were disposed to do so? What claim can *you* have to the help of the Society?" But the Council will not thus reply, but will endeavour to care for the welfare of all who belong to the class whose best interests they have ever sought to promote.

Whether the Legislature should give *equal* advantages to all in business, examined or not, is another thing. It may be said that an Act was passed twelve years ago, which declared that, to prevent ignorant and incompetent persons from practising pharmacy, it was desirable that, in future, all should be examined, etc.; and that the men who in obedience to this have with much study and expense qualified themselves, *deserve* some greater advantage than those who have neglected it; and if this should be said, it would be difficult to gainsay it; but the Council of the Society will strenuously resist all attempts to take from the whole body of Chemists any of the rights and privileges they already possess.

The Society is incorporated by Royal Charter and protected by Act of Parliament, and in virtue of this the Council claim, not as a favour, but as a right, to be consulted about every public measure affecting pharmacy. This is acknowledged by Government, and will be claimed on every occasion, whether the measure be brought forward by the Government, the Medical Council, or any one else; and, as a consequence of this, the General Committee have requested their President and Vice-President to obtain an interview with the President of the Medical Council, and the result of that visit will be communicated to the Council at their February meeting.

Meanwhile, the members may be congratulated on their present position. Is registration with a distinctive title desirable? They possess it. Is an examination necessary? They have one which has won the confidence both of the Government and of the Medical Profession. They have a benevolent fund, which has relieved every applicant who has been deserving, and which now is nearly large enough to grant pensions as well as temporary relief; and we have the pleasure of knowing that the forthcoming annual general statement of the Society will afford much satisfaction to all who wish it success.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *January 6th*, 1864,

Present:—Messrs. Bird, George Edwards, Evans, Hanbury, Haselden, Hills, Meggeson, Sandford, Savage, Squire, and Waugh,—

The following were elected

MEMBERS.

Barnstaple ....Cotton, John Lovering.
Belper ....Ashton, James.
Glasgow ....White, Thomas Walls.
Liverpool ....Utley, Alfred.
London ....Carteighe, Michael.

The following, having paid their arrears and their subscriptions for the current year, were restored to Membership:—

Darlington ....Barlow, Samuel.
Havant ....White, George.
Hulme, Manchester........................Gibson, Robert.
Portsmouth ....Childs, Joseph L.

MAJOR EXAMINATION, *Jan. 20th,* 1864.

Ferreira, Antonio Alves............................Rio de Janeiro.
Warren, George Robert............................Ware.

MINOR EXAMINATION.

Magor, Martin......................................Truro.
Pochard, Ernest François Marie..................Mauritius.

REGISTERED APPRENTICES.

NAME.	RESIDING WITH	ADDRESS.
Churchill, Walter John	Mr. Churchill	Birmingham.
Clarke, James Thomas	Mr. Hughes	Altrincham.
Cooke, Charles Fletcher	Mr. Jones	Hanley.
Emsley, Joseph	Mr. Pratt	Bradford, Yorkshire.
Ewens, Frederick Thomas	Mr. Morris	Cheltenham.
Mingay, George M.	Mr. Wigg	King's Lynn
Peck, Frederick Hamilton	Mr. Penney	Poole.
Prime, Thomas Robert	Mr. Cupiss	Diss.

PHARMACEUTICAL MEETING,

January 6th, 1864;

MR. G. W. SANDFORD, PRESIDENT, IN THE CHAIR.

The following

DONATIONS TO THE LIBRARY AND MUSEUM

were announced, and the thanks of the meeting given to the donors thereof:—

The Chemical News.
The Chemist and Druggist.
The Dental Review.
The British Journal of Dental Science.
The Photographic Journal.
The Educational Times.
The Technologist.
The Journal of the Society of Arts.
The Veterinarian.
The Medical Circular.
The Journal of the Chemical Society.
Répertoire de Chimie.
Bulletin de la Société de Chimie de Paris.
Revista Farmacéutica. From the respective Editors.
The Proceedings of the Royal Institution of Great Britain. From the Institution.
Transactions of the Odontological Society of Great Britain. Vol. iii. From the Society.
Sullo Spincervino, o Ramno Catartico. Di Giovanni Righini. From the Author.
Specimen of Goa Powder. From Mr. David S. Kemp, of Bombay.
Fruits of Cassia moschata. From Mr. Daniel Hanbury.

The following papers were then read:—

NOTE ON THE ROOT BARK OF *CHINCHONA CALISAYA.*

BY JOHN ELIOT HOWARD, F.L.S.

In almost every recent importation of the finest Calisaya bark from Bolivia

I have noticed an unprecedented amount of admixture of the *root bark*, which is easily distinguished by its peculiar characteristics, shown by the specimen I have sent to the Society. The *curly* shape in which it is found would strike the eye of every observer. It is imported in serons, along with the best quality, but often distinguished from these by an X branded on the hide. It will probably find its way into consumption for the manufacture of decoctions and tinctures, as it is not likely to be taken, except at an extremely low price by the manufacturers of sulphate of quinine. I have selected a very favourable specimen for examination, which yielded me in hydrated alkaloids of the first rough precipitation, 10 parts in 1000, but from this very low percentage a still further deduction must be made, as the purified alkaloids gave only 8·14 parts in 1000. Of this not more than 3·06 parts were obtained as a crystalline salt of quinine, and the remainder consisted almost entirely of the quinidine of Pasteur (crystallizing as an hydriodate). The substitution which thus appears to have taken place in the descent of the sap to the roots of quinidine for quinine demands further investigation, and if confirmed by other observations is not a little curious. According to Gerhardt the atomic constitution of quinine is $C_{40}H_{24}N_2O_4+n$ aq. and of quinidine (of Pasteur), $C_{40}H_{24}N_2O_4+4$ aq. One would be ready to believe in the conversion of one alkaloid into another in this case, were it not that the remarkably different and contrasted mode in which they respectively act on the ray of polarized light seems to indicate some more remarkable difference in the real structure than is manfested by ultimate analysis. It is certainly in the leaves that the first formation of the alkaloids takes place in the plant, and as some of the other constituents accompany the alkaloids unchanged (for example, kinate of lime and kinovic acid) through the whole course of the downward descent of the sap, it becomes an interesting inquiry whence so great a change as the subtitution of one alkaloid for another could arise. The mother-substance which is found in the heartwood of *Chinchona succirubra*, (as I have described under that head) is split into two or three substances in the bark, giving rise evidently to the chinchona red and also (as I think), under the influence of the *ammonia* which it is easy to detect in the external portions of the plant, to the formation of alkaloids. Patient investigation may hereafter lead to our ascertaining the mode of all these changes, which are at present sufficiently obscure.

In reference to the commercial value of the root bark of Calisaya, I have only to remark that the importers are greatly disappointed at the low estimation in which the article is held in Europe. The collectors in Bolivia had succeeded in passing this root-bark off as genuine Calisaya, which it (in one sense) undoubtedly is, and having hit upon the wasteful method of extirpating the finest species of Chinchona from the forests of Bolivia for the sake of a present profit, are now much annoyed to find that in "killing the goose which laid the golden egg" they have not even the consolation of selling the bird to advantage.

Professor Bentley said that the practical importance of Mr. Howard's communication would be at once appreciated by the meeting, when he stated that the average yield of crystallized disulphate of quinine in 100 parts of ordinary Calisaya bark, according to Pereira, Pelouze, Riegel, and others, was from 3 to 3·5 per cent., or nearly one ounce avoirdupois of crystallized sulphate of quinine in 2 lbs. avoirdupois of bark; whilst the amount of crystallized salts of quinine obtainable from the root-bark of Calisaya, as just described by Mr. Howard, was only about 3 parts in 1000. Hence it appeared that 1000 parts of the root-bark of Calisaya only yielded as much crystallized salts as 100 parts of ordinary Calisaya, indicating that the latter was, in such respects, ten times more valuable than the former.

Independently of the value of Mr. Howard's communication in a practical point of view, it also possessed, Professor Bentley remarked, great interest in

another, as it appeared to confirm, in some degree at least, the theory which Mr. Howard had first propounded when treating of "Red bark" in his valuable and beautiful work, entitled 'Illustrations of the Nueva Quinologia,' and which related to the formation of, and changes in the nature of the alkaloids in different parts of the plant, and their continual diminution in amount in the bark after it had arrived at a certain age. As the views of Mr. Howard were probably but little known to most of those present, Professor Bentley hoped it would not be considered out of place if he briefly explained them. Mr. Howard believed that there existed in the heart-wood of the plant a peculiar matter, which he had termed the mother-substance, and that this was carried up by the sap, in the course of its circulation, to the leaves, where the production of alkaloids first commenced by a reaction taking place between it and the nitrogen, which De Vry had shown to exist in them and other parts of the plant. This formation of alkaloids thus commenced in the leaves, Mr. Howard believed, was continued in the bark, and maintained up to a certain period of its age, after which the bark deteriorated in value, Professor Bentley hoped that Mr. Howard would continue to investigate this subject, but at present, we knew so little of the chemistry of vegetation, and the changes produced in the sap at different periods of its course, that it would be impossible to arrive at any positive conclusions upon the matter.

Independently of the great interest attached to the inquiry in a scientific point of view, it was also of immense importance, commercially and economically, as should Mr. Howard's views be correct, it would prove that no advantage would be gained by allowing the plants to arrive at too great an age before using their bark, as had been commonly supposed hitherto; but that the best period would be at a comparatively early period of their life. What that period should be it was impossible at present to say, but it had important bearings upon the cultivation of cinchonas in India, etc., which could not succeed commercially, if the plants were to be allowed to grow to a large size before using their bark for medicinal purposes, and for the extraction of the contained alkaloids.

Mr. Daniel Hanbury said that the only parallel which he could now remember to the results obtained by Mr. Howard, as narrated in the paper just read, were those of Dr. De Vry, who was so well known in connection with cinchona cultivation in Java. He had, like Mr. Howard, found the root-bark of cinchona to yield a comparatively small proportion of alkaloids. Had Mr. Howard isolated the mother-substance which he alluded to in his paper?

Dr. Attfield, said he should be glad to know if Mr. Howard had made any experiments with a view of artificially introducing the so-called mother-substance into ammonia. Some light might thus be thrown on the constitution of the cinchona alkaloids, and upon their relations to each other.

Professor Bentley, in reply to Mr. Hanbury and Dr. Attfield, stated that Mr. Howard had particularly referred to this mother-substance in his 'Illustrations of the Nueva Quinologia,' and in a letter to the Editor of Seemann's 'Journal of Botany.'* (See also Pharm. Journ. vol. v. p. 75.)

Mr. Waugh inquired if there would be any sensible difference between a decoction of root-bark and one of the best Calisaya bark; was it possible to be deceived?

Dr. Redwood said that there would be no sensible differences in the two decoctions; and this remark applied not only to the mixture of root-bark with that of true Calisaya, but also to other substitutions for, and adultera-

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* Mr. Howard has since informed us, that *he has* isolated the mother-substance, and had it carefully analysed by Mr. Morland, when it gave apparently the same result as the kinovic acid of Schwartz. He also states that he is at present investigating the green colouring-matter of the leaves, and endeavouring to gather up more light on the whole subject.—R. B.

tions of, true Calisaya, some of which contained comparatively a small proportion of alkaloids. He did not believe that even Calisaya bark yielded the amount of quinine in a crystallizable state which was sometimes ascribed to it.

ON GOA POWDER.

BY MR. DAVID S. KEMP.

As found at Bombay, Goa powder is a light powder of a chocolate-brown colour. A specimen of it is sent herewith to the museum of the Pharmaceutical Society.

It is used very successfully in obstinate skin-diseases, particularly for a kind of ringworm to which Europeans and natives are very subject in this country and China; it is rubbed on the skin with water or lemon-juice. Regarding its history, the only authentic information I can obtain is, that a case of the substance was imported into Goa, on this coast, some twelve years ago by a Portuguese merchant; it was in the form of masses, mixed with fragments of root, stems, bark, or some such matters. The masses were reduced to powder at Goa and sold there. The importer ultimately left Goa for Mozambique, where he died. This information I had from a Parsee who was in the service of the importer at Goa; I have heard also from another source that the drug is manufactured at Mozambique. Goa powder when heated, fuses into a black resinous mass and burns like aloes. The charred residue first produced may be ultimately burnt to a minute white ash. It is insoluble in water; partially soluble in benzole, alcohol, and resinous solvents; almost wholly soluble in caustic potash solution, and totally soluble in oil of vitriol, from which it precipitates on the addition of water. Heated in a tube, a yellow powder and a tarry oil sublime, leaving a charred residue. The following is a quantitative analysis of an authentic specimen of the drug.

A portion of the powder weighing ten grammes was exhausted with benzole, and the solution (of a deep yellow colour) allowed to evaporate spontaneously. As the liquid volatilized, a substance was left which was purple externally, and of a bright golden colour on the side attached to the glass; after some time a few hard, purple crystalline tufts were also deposited on the bottom of the vessel. The residue of evaporation weighing 5·05 grammes, treated with solution of caustic potash, was in most part dissolved, producing a deep blood-coloured liquid, and 0·761 gramme of a light green residue (B).

The portion of Goa powder insoluble in benzole, was treated with solution of caustic potash, and was entirely taken up by that liquid with production of a dense claret-coloured solution (C).

Both of these substances, soluble in potash, were precipitated by the addition of acids, and obtained as powders (A and C) of extreme fineness. Another portion of Goa powder burnt in a platinum crucible yielded 0·3 per cent. of a white ash.

The composition thus obtained was:—

A. Substance soluble both in benzole and alkalies	42·89
B. Substance soluble in benzole and insoluble in alkalies	07·61
C. Substance insoluble in benzole and soluble in alkalies	49·2
Ash	0·3
	100·00

A. The substance soluble both in benzole and alkalies was obtained by precipitation from its alkaline solution by acids, as a brownish-yellow powder,

slightly bitter in taste, almost insoluble in hot or cold water, to which however it imparts a faint tint of pink; soluble in alcohol, ether, chloroform, and benzole, producing yellow solutions from which, with care, it may be obtained in rough purple crystals; soluble in solutions of caustic alkalies, less so in their carbonates. It appears to possess feeble acid properties, forming compounds with metallic oxides, which are easily obtained in the dry state, but its alkaline solutions deposit it unchanged on desiccation. Acetate of lead, and chlorides of tin and iron precipitate it from its alkaline solutions, the lead and tin precipitates acquiring a delicate pink tint. Its alkaline solutions are of a dense blood-red colour. At a temperature under 400° Fahr. it is partially volatilized, and condenses as a yellow powder.; a charred residue and a tarry oil being also produced. Nitrogen could not be detected by Lassaigne's test.

B. That portion of the benzole extract which, after the evaporation of the benzole, was insoluble in alkalies, was obtained as a light green substance. It is sparingly soluble in alcohol and resinous solvents; more soluble in boiling alcohol, from which it may be procured in small green crystals having a faint golden lustre. It is insoluble in water and alkaline solutions, and contains no nitrogen. By the action of heat it is decomposed with production of a yellow sublimate possessing the properties of substance A.

C. The body insoluble in benzole was precipitated from its alkaline solution as a dark indigo-coloured powder, drying into a hard cake. It is apparently not absolutely insoluble in water or alcohol, as it tinges those liquids of a faint violet colour. It is insoluble in chloroform and resinous solvents. It is quite soluble in caustic alkaline solutions, producing liquids of a dense claret-colour.

Its deportment with solutions of lead, tin, and iron is similar to that of A; its characteristic colour in combination with white oxides being a lilac or violet. It is not volatilized by heat. Lassaigne's test showed the presence of nitrogen.

Each of these substances, A, B, and C, dissolves in oil of vitriol, and precipitates on the addition of water. In many of their properties they seem to resemble products obtained from archil, litmus, and cudbear.

The only approach to identification that I can make is in comparing the foregoing description of substances A and C with the following, given by Pelouze and Fremy, of *Erythroleic acid* and *Azo-erythrin*, two bodies obtained from Orchella weed in the production of Archil, and the other colouring-matters. "L'azo-érythrine est insoluble dans l'eau, dans l'alcool et dans l'éther; soluble dans les alcalis, qu'elle colore en rouge vineux.

"L'acide érythroléique est soluble dans l'alcool et dans l'éther, presque insoluble dans l'eau, soluble dans les liqueurs alcalines; il est d'une couleur pourpre.

"M. KANE."*

Orchella weed is exported in large quantity from the coast of Africa, north of Mozambique, and it seems to me that that production is the most probable source of Goa powder.

It is much to be regretted that so valuable a drug should disappear from the market. Any one who would furnish information whence supplies could be obtained would render a service to a multitude of sufferers.

" . . . By mentioning the importation into Goa of one package of Goa powder, I meant that I had authentic information of only that one shipment. It is not improbable that more than one shipment has been received, but I believe it was never a regular article of import. It is not now to be procured there, but a factitious preparation (a mineral powder) is made and sold instead. I am now unable to procure a grain of the true.

"Goa powder found its way from time to time into Bombay in round tins (not labelled), holding about one pound each; these tins were sold at from twelve to

* 'Chimie Générale,' Pelouze et Fremy, vol. v.

thirty rupees (24*s.* to 60*s.*) each. The drug, I believe, made its appearance here about twelve years ago,—whether for the first time or not, I do not know. The people who have had it to sell are half-caste Portuguese. It has no native name here other than *Ringworm Powder*, *Goa Powder*, or *Brazil Powder*, pronounced in native fashion. The last name is seldom used, but may afford a clue to its origin.

"Goa powder was used by both Europeans and natives, and equally valued by each. The peculiar cutaneous disease for which it is a specific is so prevalent here and at the ports of China, that it may be held to be one of the scourges of the climate,—a red itchy patch, bounded by little pustules, of which the line gradually extends with the disease. No other remedy cures it but the strongest caustics."

Dr. ATTFIELD stated that he had examined some of the Goa powder sent by the author of the paper to Mr. Hanbury, and he could confirm Mr. Kemp's description of it. It appears very nearly to resemble Cudbear, which would be a tolerably good representative of it, excepting that Cudbear always contained ammonia.

Mr. WAUGH inquired if Goa powder had been tried medicinally in this country, as many substances used as native remedies in India and other foreign countries were found to be very worthless, and such might be the case with this. He thought before they took much trouble to analyse such a substance, they should know whether it was likely to be of any use.

Mr. HANBURY said it had not been tried in this country.

NOTE ON THE RECOVERY OF ESSENTIAL OILS FROM THEIR WATERY SOLUTION.

BY MR. T. B. GROVES.

I had occasion a short time since to attempt the concentration of an aromatic water into a spirituous essence. It occurred to me to try the process stated, in the "Reports of the Juries, 1851, article 'Soaps and Perfumery,'" to be practised by M. Piver. Accordingly I agitated the water in successive portions, with about one-eighth its volume of olive oil. This process, although laboriously followed, with proper care taken in recovering the oil after each shaking, failed to transfer any large proportion of the aromatic oil from watery to oily solution.

A slight modification of the process which it is the object of this note to point out, made it succeed admirably, and at the same time saved the whole of the manual labour.

The olive oil added was *emulsed* in the aromatic water by solution of potash: after standing for some time, the emulsion was destroyed by the addition of an acid, when the olive oil immediately rose to the surface, dragging with it almost the whole of the aroma. From the fatty oil the aromatic oil was easily separated, by agitation with rectified spirit.

I have not ascertained by experiment either the best fatty body to use in this process, or the best mode of effecting or destroying the emulsion, I leave these points open for those who use the method practically; but it appearing to me to be capable of being put to some use, at least in scientific inquiry, I have ventured on the above short recital of the facts.

NOTE ON CASSIA MOSCHATA, H.B.K.

BY DANIEL HANBURY, F.L.S.

Among the many botanical treasures with which the travels of Humboldt and Bonpland enriched the herbaria of Europe and which were described in that noble work the *Nova Genera et Species Plantarum*, is a species of *Caissa* discovered on the shores of the Magdalena in New Granada. This plant was placed by Kunth in that section of the genus of which *Cassia Fistula* L. is the type, and which is characterized by a long, woody, indehiscent legume, divided into cells by transverse septa; and, as the pulp (or more correctly *juice*) surrounding its seeds was found to have when fresh a musky odour, it received the specific name of *moschata*. The specimens collected by Humboldt did not include flowers, and though the fruit was described, it does not appear that specimens were sent to Europe. The plant was therefore known only from the description in the *Nova Genera* and from specimens consisting of leaves only, one of which is preserved in the Museum of Paris. A description of this *Cassia* was subsequently published in the *Prodromus* of Decandolle, in the *Synopsis Generis Cassiæ* of Vogel, and in Don's *System of Gardening and Botany*, but as none of these authors appears to have had other material upon which to build than the original notice of Humboldt, the plant remained very imperfectly known.

It happened however that in the early part of the year 1862 the late Mr. Sutton Hayes forwarded to London from Panama, pods of a species of *Cassia* known there as *Canafistola de purgar*, having a strong resemblance to *Cassia fistula*, but differing chiefly in being of smaller size. In reply to my observation that these pods were simply those of *C. Fistula* L., apparently somewhat dwarfed by want of culture or a poor soil, Mr. Hayes remarked:—

"I think you are wrong as to the tree which produces the pods I sent you being a form of the true *C. Fistula*. I have often seen both trees; and the true *C. Fistula* is much less like the *Canafistola de purgar* than many other species of *Cassia*. The flowers of *C. Fistula*, L., are of a light yellow and in very long racemes, and the leaflets are different in shape and much larger. The flowers of the *Canafistola de purgar* are yellow, becoming brick-red with age; the racemes are much shorter than those of *Cassia Fistula;* and the leaflets are altogether different, being much smaller and quite like those of *C. brasiliana;* in fact, the *Canafistola de purgar* is much nearer *C. brasiliana* than it is to *C. Fistula*. The wood of the tree is very dark-coloured, heavy, and compact, and is considered one of the best on the Isthmus: it makes excellent fuel. The tree is very common in open woods on hills, and is perfectly indigenous; whereas *C. Fistula* is to be found only about towns and in old cleared places, as if introduced. I have never seen *C. Fistula* in the virgin forests. *C. brasiliana* is very common about Panama."

Mr. Hayes having with these remarks sent me some excellent flowering specimens of his *Canafistola de purgar*, it became immediately evident that the plant was wholly distinct from *Cassia Fistula* L. Further examination and a careful comparison with specimens, including the type specimens of *C. moschata* H.B.K., and some more recently brought from New Granada by my friend M. Triana, proved, as conclusively as in such case was possible, that Mr. Hayes's plant and *Cassia moschata* H.B.K. were identical. Being now in possession of complete specimens, I presented a description of the plant to the Linnean Society, which, with a figure, has been recently published.* *Cassia moschata*

* *Linnean Transactions*, vol. xxiv. p. 161. pl. 26. The technical description of the plant is as follows:—

H.B.K. is allied to *C. Fistula* L. and *C. brasiliana* Lam.: from the first, it is distinguished by its multijugate leaves and shorter racemes; and from the second, by its much smaller legume which is devoid of prominent sutures.

But it is in its pharmaceutical aspects that I wish to draw the attention of the Society to *Cassia moschata*. Many years since, M. Henry of Paris published a notice of a sort of Cassia which had been imported from America and had then newly appeared in French commerce.* This drug bore a close resemblance to Cassia fistula, differing from it principally in its smaller size, pale-coloured, somewhat astringent pulp, thinner septa, and in the legume being attenuated into a point at either extremity. M. Henry published an analysis of the extract obtained from this Cassia, and contrasted its properties with that afforded by ordinary Cassia fistula, the result showing the two to be exceedingly similar. A description of this cassia was also published by Professor Guibourt, who expressed the opinion that it might be derived from a species of *Cassia* distinct from *C. Fistula* L.† Much more recently, my friend Mr. Morson obtained a package of a small variety of Cassia imported from New Granada, which I felt no hesitation in regarding as the *Small American Cassia* (*Petite Casse d'Amérique*) of the French pharmaciens, and which I now consider I am warranted in referring to the *Cassia moschata* of Humboldt and Bonpland.

CASSIA. Sect. *Fistula, DC.* Subsect. *Ebracteatæ.*

C. MOSCHATA (H., B., K., Nova Genera et Species, vi. 338); arborea; foliolis multijugis, oblongis, apice rotundatis, utrinque pubescentibus deinde supra glabrescentibus, antheris glabris, leguminibus cylindricis.

DC. Prod. ii. 489; Vogel, Synopsis Generis Cassiæ, 11; Walpers, Rep. i. 812; *Cathartocarpus moschatus*, Don, Syst. of Gard. and Bot. ii. 453.

Hab. Ad isthmum Panama, ubi ab incolis *Canafistola de purgar* vocatur (*Sutton Hayes*, No. 58); ad fluvium Magdalena (*Humboldt et Bonpland, Triana*); ad ripam fluminis Casiquiare paulo infra ostium superius, arbor unicus ab Orinoco, ubi abundare dicitur, allatus (*Spruce*, No. 3300); ad pagum Villavicencio prope Bogota (*Triana*, No. 4376).

Arbor 30–40-pedalis, ramulis novellis flavescenti-pubescentibus. *Folia* alterna, abrupte pinnata, petiolo communi 4–10 poll. longo, pubescente, supra pubescentia ampliore flavescente. *Foliola* 10–18-juga, subopposita vel alterna, oblonga, inæquilatera, basi utrinque rotundata, apice obtusa, interdum mucronulata, reticulato-venosa, 1½–2 poll. longa, 6–7 lineas lata, margine integerrimo, pubescente, nervo medio subtus prominente, pubescente, pagina foliolorum superiore nitida parce et breviter pilosa vel glabrescente, inferiore fuscescenti-pilosa vel puberula. *Stipulæ* triangulares, caducæ. *Racemi* laterales, 6–10-pollicares, simplices, graciles, puberuli. *Flores* flavi, mox rubescentes. *Pedicelli* ad 5 lineas longi, gracillimi, minute pubescentes. *Calyx* quinquesepalus, puberulus vel glabrescens, sepalis rotundatis, obtusis, concavis, reflexis. *Petala* quinque, concava, reticulato-venosa, flava, glabra, subæqualia, semipollicaria; superius ovale, longe unguiculatum, altera suborbiculata, breviter unguiculata. *Stamina* decem, inæqualia, glabra: quatuor inter se æqualia, corolla parum breviora; tria his triplo vel quadruplo longiora, curvata, basi geniculata; tria brevissima, quorum lateralia incurva, medium filamento crasso, dilatato. *Antheræ* staminum quatuor breviorum ellipticæ, bilobæ, basi et apice biporosæ, dorso medium versus affixæ; antheræ staminum trium longiorum late ellipticæ, birimosæ, introrsum dehiscentes, basi affixæ; antheræ staminum trium brevissimorum birimosæ, tribus supradescriptis haud dissimiles sed valde minores. *Ovarium* longe stipitatum, lineare, adscendens, falciforme, margine superiore basin versus parce pilosum, aliter glabrum. *Stigma* oblique truncatum. *Legumen* cylindricum, rectum, 1–1½-pedale, lignosum, durum, læve, corticatum, breviter apiculatum vel obtusum, septis transversis numerosis ut in *Cassiæ Fistulæ* L. legumine (cui simillimum) instructum. *Semina* ovato-rotundata, compressa, nitida, durissima, 3 lineas longa, coloris cinnamomei, in succo saccharino adstringente immersa.

The wood-cut represents a raceme of flowers, legume and leaf, (somewhat reduced in size); on the right, a flower, the sepals and petals of which have been removed; on the left at top, the stipitate ovary; below on the left, an anther of one of the 3 long stamens,—next to it, an anther of one of the 4 medium-sized stamens, one of the 2 short lateral stamens and the central short stamen with inflated filament (all magnified).

* *Journal de Chimie Médicale* ii. (1826) 370. † *Hist. des Drog.* iii. 347.



Cassia moschata, H.B.K.

M. Triana, who is now engaged in writing a flora of New Granada, informs me that the legumes of *Cassia moschata* supply the place in that country of Cassia fistula, a fact which renders their occasional importation into Europe not surprising. From Cassia fistula, they may be distinguished by their smaller size (1 to 1½ feet long by 6 to 8 lines broad); their form, which is less regularly straight and cylindrical and often attenuated at the apex; and their pale, austere-tasting pulp. This last character would render their substitution for ordinary cassia undesirable.

Professor BENTLEY was glad to find that Mr. Hanbury had satisfactorily traced the botanical source of the *Small American Cassia* to *Cassia moschata* of Humboldt and Bonpland. Mr. Hanbury had referred to the analysis of this kind of cassia which had been made many years since by M. Henry, and which had been published in the *Journal de Chimie Médicale*. He (Professor Bentley) had not referred to that analysis for some years, but so far as he now remembered, he thought M. Henry had published two analyses, one of the *ordinary officinal Cassia Fistula*, and another of the present *Small American Cassia Fistula*, by which he had shown that the *latter* contained *much less* of the matter resembling tannic acid, and *more* sugar, etc., than the former. This was remarkable, as, judging from the astringent taste of the pulp of the *Small American Cassia Fistula*, and comparing it with the taste of *officinal Cassia Fistula*, we should have expected the reverse. It was desirable that a fresh analysis should be made of the two kinds of cassia pulp.

BOTTLES AND LABELS FOR PREVENTING ACCIDENTAL POISONING.

The PRESIDENT said the very important question of the prevention of accidental poisoning had often been brought before meetings of their Society, but it appeared that the subject was not yet exhausted, as two gentlemen were prepared on that occasion to submit their inventions bearing upon the question to the meeting.

Mr. ALEXANDER exhibited and explained several samples of bottles with Thompson's Patent Stopper adapted to them, of which there were three kinds: one requiring a detached key to unlock it, and therefore considered suitable for use as a poison-bottle; another in which the key was combined, which when not in use would rest in a countersunk recess on the head of the capsule; and a third, in which the head of the capsule itself, having a milled edge, formed the key for unscrewing the cap. Mr. Alexander said that the firm to which he belonged would shortly be prepared to introduce the patent stoppered bottles to the public, at such moderate prices as would favour their extensive adoption.

The PRESIDENT was inclined to think that the detached key might easily be lost, and that would cause much inconvenience and loss of time. He thought it would be impossible to bring these bottles into general use. They could not send out a key with every bottle of a poisonous substance. He thought also there was an objection to the use of metallic caps to the bottles.

Mr. WAUGH was not very favourable to poison-bottles. He thought it would be safer and easier to put the bottle, poison and all, under lock and key, than to leave the bottle out and put a lock upon the stopper. It would not be pleasant to add to a bunch of keys one that unlocked the poison-bottle, and he could in some cases imagine the consternation caused by its loss. He was, however, much struck with the remarkably low price at which these locked bottles were produced.

Mr. THONGER then exhibited his Patented Caution Label. It consisted of the ordinary retail or dispensing label, with a broad border of sand-paper, which being rough would be felt by the dispenser or patient in handling the bottle, and he would thus be reminded that the bottle contained a poisonous or dangerous preparation.

The PRESIDENT thought Mr. Thonger's label had the advantage over other methods that had been suggested for indicating the presence of a poisonous or dangerous preparation, that it could be applied to or removed from any ordinary bottle, and would thus obviate the necessity for the use of a distinct poison-bottle.

Mr. ROBBINS remarked that in dispensing it was the practice to take hold of the shop-bottle in such a way as not to touch the label with the hand, and therefore the label in such cases could not be felt. He had seen a different, and he thought a better method adopted, which was to have two or three long strips of sand-paper pasted on the sides of the bottle. In this case the bottle could not be held without feeling the roughened surface of the paper.*

Mr. HILLS thought Mr. Thonger's label the best he had seen for the purpose for which it was intended; he thought also that the patent capped bottles would be useful in certain cases; but he did not consider that either would afford a sufficient guarantee of safety without the exercise of caution and the use of the eyes. It was dangerous to trust to the sense of touch, and to take medicine in the dark or without reading the label. He recommended the use of the angular fluted bottles, which were introduced by Mr. Savory, and had since been patented by Mr. Towgood. These bottles were now adopted by the Army and Navy Medical Boards, and by many private firms. There was one advantage, that the flutes were always present.

CHEMICAL DISCUSSION ASSOCIATION
OF THE PHARMACEUTICAL SOCIETY.

The sixth anniversary meeting of the Association was held at 17, Bloomsbury Square, on Monday evening, January 11, 1864; the President, Dr. T. REDWOOD, in the chair.

The following Report of the Committee was read:—

The Committee, in presenting their Report to the Sixth Anniversary Meeting of the Chemical Discussion Association, have to congratulate the members on the success which has attended the meetings of the Association during the past year. In comparison with the two previous years especially, a decided improvement is observable, not only in the attendance, but also in the number and value of the communications received. As attention becomes more and more directed to the importance of stimulating chemical investigation among the members of the pharmaceutical profession, it is hoped that the advantages presented by the Association in fostering and carrying out original research will be more and more appreciated.

The Committee think this a favourable opportunity for recalling to mind the means by which the Association proposed, at the time of its establishment, to effect the objects it had in view, and which were stated in the First Annual Report, in January, 1859.

"As the future success of the Society will depend upon the manner in which the meetings are supported, the Committee would take this opportunity of reminding the members that the communications suitable for our meetings need not be in a finished state when presented, as one of the objects which the Society has in view is for the members mutually to assist each other in the working out of subjects, which may be thus prepared and rendered fit for publication or presentation elsewhere. They would therefore suggest that whenever any unexplained or interesting phenomena present themselves in the

* We have since received a note from Mr. Thonger, in which he says that the adoption of this method would be an infringement of his patent.

course of experiments, or of the ordinary chemical and pharmaceutical operations in which the members may be engaged, including peculiar reactions which frequently occur in the making up of prescriptions, or whenever any new instances of impurity or adulteration are met with, these will form suitable subjects to be discussed and investigated, and may, with that view, be brought before the meetings of the Association from time to time, until the investigation is considered to have been carried to a sufficient extent. Members are also invited to bring forward, and to illustrate and explain in such manner as to render them as interesting as possible, the subjects of papers which are published in the scientific journals. It is proposed in this way to extend among the members of the Association the knowledge of the daily progress which is made in chemistry and the allied sciences."

The programme thus laid down at the commencement has been rigidly adhered to, and, it is believed, with considerable success. While the spirit of scientific inquiry has been kept up among the members, advantage has at the same time accrued to the Pharmaceutical Society by the production from time to time of papers which have been read at Pharmaceutical Meetings and published in the 'Pharmaceutical Journal.'

Nine new members have been admitted, and seven ordinary meetings have been held, during the past year.

The following is the list of communications which have been received:—

"On Commercial Tincture of Sesquichloride of Iron." By Mr. J. M. Davenport.—Afterwards published in the 'Pharmaceutical Journal.'

"On the Preparation of Clark's Soap Test." By Mr. C. H. Wood, F.C.S.—Afterwards read at a Pharmaceutical meeting, and published in the Journal.

"On a Method of Dissolving Alkaloids in Oils." By Dr. Attfield.—Also read at a Pharmaceutical meeting, and published.

"On Oxide of Copper." By Mr. E. C. C. Stanford, F.C.S.—Afterwards read at a Pharmaceutical meeting, and published.

"Magnetic Peroxide of Iron."—The Secretary drew attention to a paper by M. Malaguti on this subject, in which similar experiments were described to those brought before the Association some years back by Mr. Robbins. The Secretary repeated this statement at a Pharmaceutical meeting, and it was published. M. Malaguti has since acknowledged Mr. Robbins's experiments.

"On the Production of Oxamide." By Dr. Attfield, F.C.S.—Afterwards read at a meeting of the Chemical Society, and published in the Journal of that Society.

"On the Crystals of the Oil of Vitriol Chamber." By Mr. J. Broughton, B.Sc.

"On the Concentration of Acetic Acid." By Mr. C. H. Wood, F.C.S.

"On the Action of Chlorine upon Ammonia." By Mr. C. H. Wood, F.C.S.

"On the Hydration of Cyanogen." By Dr. Attfield, F.C.S.

"On the Reduction of Chloride of Silver." By Mr. C. H. Wood, F.C.S.

"On the quasi-spontaneous Splitting-up of Olive Oil." By Mr. T. B. Groves, F.C.S.

"On the possible Number of Ammonia Derivatives." By Mr. J. Broughton, B.Sc.—Afterwards published in the 'Chemical News.'

"On the Action of Light on Medicines." By Mr. C. H. Wood.

"Further Observations on the Oxidation of Cod Liver Oil." By Mr. J. Robbins.

The Treasurer's account showed a balance in hand of £3. 18*s*. 10*d*.

A ballot was taken for the election of four members to serve on the Committee, and the following were declared to be the officers for the ensuing year:—President, Dr. T. Redwood; Treasurer, Mr. S. Gale; Secretary, Mr. C. H. Wood. Committee: Messrs. J. Attfield, J. T. Fewtrell, A. F. Haselden, J. Robbins, J. Ince, and W. A. Tilden.

The meetings were appointed to take place on the first Monday in each month.

PROVINCIAL TRANSACTIONS.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Fifth General Meeting of the Association for the Session was held at the Royal Institution, on Thursday, December 3; the President in the chair.

The following gentlemen were elected members:—Messrs. S. G. Wheeler and H. Moses.

To the museum was presented, through Mr. Evans, a specimen of bark, resembling Calisaya bark, recently introduced from Pará, by J. E. Howard Esq.

The following letter from Professor Hamilton, detailing the experiments referred to in his letter read at the last meeting, was read.

Dear Sir,—I send you the details of the experiments on dialysis, made in July and August, and since repeated with the same results.

Experiment 1.—A portion of egg-albumen was mixed with about ten times its volume of water and filtered; a drop of the clear filtrate, when evaporated on a slip of glass, left a deposit which turned black on further heating over the gas flame.

Experiment 2.—Placed the filtrate in a dialyser, and the dialyser in an evaporating-basin on the surface of a clear, filtered, weak solution of common salt. After seven days the liquid in the basin was transferred to a glass beaker and examined,—no albumen could be detected.

Experiment 3.—Washed the dialyser, and introduced a fresh portion of solution of albumen. The lid of a platinum crucible was placed in the dialyser, and the positive electrode of a cell of Daniell's battery was placed in contact with the lid; the negative electrode was placed in the solution of salt on which the dialyser rested. After eight days the solution of salt was examined for albumen. An abundance of flocculi appeared. Some of these, taken out on the end of a glass rod and heated on a slip of glass, darkened in colour, and finally became black and charred.

Experiment 4.—Arranged the experiment as before, but without the battery, and substituting solution of gelatine for the solution of albumen. After fourteen days, examined the solution and found that gelatine had passed through.

Experiment 5.—Washed the dialyser thoroughly, and allowed it to become dry. Pure water was poured into it, it was placed in a clean, dry, evaporating basin, and allowed to stand for seven days. At the end of that time not one drop of water had passed through.

Experiment 6.—Being satisfied from experiment 5, that the dialyser was not porous, I introduced a fresh solution of gelatine, and placed the dialyser on the surface of pure water, and allowed it to remain for a month. At the end of that time the water was placed in an evaporating-basin and boiled,—it gradually darkened in colour, thickened, bubbled up, emitting a smell like that of glue, and left an abundant residue of charred gelatine.

I am, yours very respectfully,

George Hamilton.

H. Sugden Evans, Esq., Hon. Sec. Chemists' Association.

M. Murphy, Esq., read the paper of the evening, "On the Products of Coal Tar." A short discussion ensued. A vote of thanks was cordially accorded to Mr. Howard, for his donation, Professor Hamilton for his letter, and Mr. Murphy for his excellent lecture, and the meeting separated.

The Sixth General Meeting was held on Thursday, 17th December, at the Royal Institution; the President in the chair.

Mr. Henry Bird exhibited and explained his new Automaton Petroleum, or Mineral Oil Testing Apparatus. Not having received the drawing illustrating the apparatus, the description of the same is unavoidably deferred.

LEEDS CHEMISTS' ASSOCIATION.

The Fourth Ordinary Meeting of the Association for the session was held on the evening of January 13, 1864, at the School of Art; Mr. Thompson in the chair.

Mr. Yewdall called the attention of the meeting to a bottle for keeping essential oils. It did not claim novelty of form, since it was a modification of the bottle much used for castor oil, glycerine, etc., but Mr. Yewdall thought that its merits for keeping essential oils had not been recognized so much as they deserved. It prevented evapora-

tion and oxidation, and preserved the gold labels uninjured. It would be cheap, because an ordinary neck formed the reservoir.

A four- or eight-ounce round shop-bottle has a short lipped tube ground in by way of stopper, having a notch that returns any surplus oil, and a glass cap covers all. Messrs. Maw and Son had supplied the specimens shown.

Mr. Edward Brown read the paper of the evening, upon "Medicated Waters."

He observed that whilst the importance attaching to various objects met with in pharmacy varied greatly, the potency of many principles claiming for them this interest, the class of medicated waters, on the other hand, demanded our best attention from the universality of their employment.

The title adopted embraced waters of both natural and artificial origin, as medicinal springs, waters aerated by art, etc., as well as the class termed Aquæ in the Pharmacopœia. It was this latter section of the subject to which he proposed chiefly to confine himself.

There were one or two allied watery solutions deserving a word. The process of the Pharmacopœia for making mistura camphoræ was needlessly tedious, and without recommending the deviation, he believed the best plan was to use a graduated spirituous solution of camphor. The U. S. Pharmacopœia employs magnesia to subdivide the camphor, but the objections to this method are manifest. If spirit be objectionable, here is a case in which powdered silex might well be used, no more camphor being employed than would dissolve. The solution might be decanted from the silex, and at least twenty-five per cent. more camphor could be thus dissolved than by the officinal process.

A reference to the older Pharmacopœias shows that medicated waters occupied a more prominent place than at present, and that the act of distillation was regarded as essential to their virtues. Possibly we have seen the other extreme of error in the liberty now given by the Pharmacopœia to dispense with the distillation at our mere option.

In the Pharm. Lond. 1677, waters are thus divided:—

1. Simple common distilled waters—five are from roots; nineteen from flowers; eighty from leaves and buds; eleven from fruits, and eight from animal sources.

2. Waters in which the ingredients are macerated before distillation. It is worthy of remark that in neither of these long lists do we find the waters of greatest modern repute—cinnamon, peppermint and dill. In the Pharm. Lond. 1788, the list of distilled waters is hardly larger than at the present day.

The introduction of a trace of alcohol, which in the earlier formulæ was attained by the macerating process, in which wine, etc., was sprinkled over the ingredients, was now maintained as an addition *after* distillation. It is singular to note the pertinacity of the London College in adhering to this now exploded error, down to 1836. On the other hand, the Edinburgh College had given up its use as far back as 1774. That the addition of a little spirit to medicated waters generally does not preserve them, but usually results in the formation of acetic acid, is now well recognized.

Mr. Brown alluded to the substitution of spring water for pure distilled water in dispensing, and pointed out that a difference so perceptible in the act of washing the hands must be more than a trifle as affecting many uses for an invalid.

Of the nine waters in the Pharm. Lond. 1851, two are ordered to be distilled, and the preparation of the remaining seven is left to the option of the dispenser to distil, or to prepare by means of an essential oil.

Was it really a perfectly indifferent point? This suggested another question, viz. are any constituents of plants carried over during distillation besides the essential oils?

He thought that with dill water a trace of benzoic acid was so obtained; but the whole question was a difficult one, in which the senses of taste and smell must chiefly decide, and he thought they did this very strongly in favour of the distilled dill-water. Cinnamon water came under the same category. Pimento water was less improved by distillation.

The three waters obtained from species of *mint* gave a different result, and the diffused oils yielded better products than when the herbs were distilled.

Was previous maceration of the ingredients desirable? Mr. Brown advised it strongly for a period of twenty-four hours in the case of dill and cinnamon, the product being fuller-flavoured. In this respect the old instructions were worth attention.

Rose water and elder-flower water were directed to be distilled from the flowers. The latter was extremely prone to become "mothery," but when the pickled flowers are used, this disposition is much less shown. A very minute trace only of chloride of sodium could be detected in the water, and would not counterbalance the great gain in keeping qualities.

Mr. BROWN referred to a paper on "Distilled Waters," by Mr. Warington (Pharm. Journ. vol. iv. p. 558), in order to introduce the subject of triturating essential oils with water. The author depreciates, with good reason, the use of magnesia, and advises powdered glass or flint.

He found the former to be partially soluble, and was not disposed to regard the forms in which silica was often used as being satisfactory. Thus, he had been accustomed to use a fine and well-washed sand as the medium for triturating essential oils with water; but as soon as the water was added, however gradually, the oil left the sand and rose to the surface, and from that moment its useful effect was lost.

Magnesia was more efficient mechanically, and as it diffused through the water with the oil, it served admirably the purpose intended; but its solubility was a grave objection to its use.

Mr. BROWN had regarded it as a desideratum to find some better process, and had turned his attention to a method of digestion. He placed distilled water and an essential oil, in suitable proportions, in a strong stone bottle, immersed this in a water-bath, agitated occasionally, and when the contents of the bottle reached a temperature of 203° to 206, securely corked it, and continued the heat for half an hour. The method appeared quite rational; the diffusion of the oil would be promoted by the currents in the heated fluid, and the increased pressure within the bottle had also a further influence. The specimen of peppermint water thus prepared had a strength superior to that usually found.

Some of the specimens exhibited had been prepared in small quantity by confining the materials in the head of the still, and passing the steam through them,—a plan which ought to be found advantageous for the more delicate waters, as rose-water.

A large series of specimens was placed upon the table, illustrating the statements made. In the discussion which followed, Mr. Yewdall stated that he used fine sand for triturating with the essential oils, employing it freely, and was quite satisfied with it.

Mr. REYNOLDS wished to refer to a paper on "Distilled Waters," by Mr. Haselden (Pharm. Journ. vol. xvi. p. 14), the general conclusions of which as to distilling particular waters, or otherwise, corresponded with those arrived at by Mr. Brown. It was surprising how little attention had been paid to the subject, and the present paper was, as far as he knew, the most comprehensive in its scope that had been offered to the pharmaceutical world. He believed that it was not well understood what the College meant by "powdered silex." If it was the substance he now exhibited, prepared for use in pottery by calcining flints and grinding them, it appeared admirably suited to the purpose, but it was evident that fine sand was constantly employed under the idea that it was a proper form of silica.

Mr. ATKINSON was in the habit of using the powdered flint, and thought it a good plan to pour the oils upon it, add the water hot, and leave till cold. He thought the method of digestion now suggested would be readily carried out.

Mr. CLAYTON queried whether the trifling precipitate in elder-flower water made from "pickled" flowers was not due to organic matter rather than to chloride of sodium.

THE PROPOSED AMENDMENTS OF THE MEDICAL ACT.

MEETING OF CHEMISTS AND DRUGGISTS AT DUDLEY.

Following the movement in other places, a meeting of the chemists and druggists of Dudley and its immediate vicinity was held in the committee room of the Mechanics' Institute, on Tuesday last, for the purpose of taking into consideration the amendments proposed to be inserted in the Medical Act, intended to be applied for by the Medical General Council in the next session of Parliament. About eighteen chemists and druggists were present, including Messrs. Hollier, Morris, Bell, Gare, Owen, White, Bradley, Dunn, Dudley; Messrs. Nicklin and Swinnerton, Tipton; Mr. Geary, Brierley Hill; Messrs.

Bishop and J. Nock, Cradley; Messrs. Allsopp, Buck, and Tonge, Oldbury; Mr. Thompson, Sedgley. The meeting was presided over by Mr. Hollier, pharmaceutical chemist, Dudley. Communications were received from Mr. Buck, Dudley; Messrs. Steward and Rooker, Brierley Hill; Messrs. Bache and Wilshaw, Pensnett; and Mr. Wilshaw, Wordsley; expressing regret at their inability to attend, and promising support, by subscription or otherwise, to any movement having for its object the furtherance and protection of the interests of the trade.

The Chairman explained the object of the meeting, and stated that they were called together to consider certain clauses which were proposed to be inserted by the Medical Council in an amended Act, which it intended to apply for during the ensuing session of Parliament. As many present hardly knew anything about the Act itself, much less the obnoxious clauses proposed to be introduced, he would read over those clauses which appeared to him to have reference to chemists as they stand in the present bill, and as intended to be altered. The first was the 20th clause, where, in addition to the powers already delegated to them respecting medicine and surgery, the Council assume to themselves also that to regulate the examinations as to pharmacy. In clause 31 the Council again introduce pharmacy, giving only to those persons qualified under their Act power to sue in any court of law for medicines so supplied, or prepared for patients or otherwise. In clause 55, as it at present stands, reservation is made of all the existing rights of chemists and druggists, "providing that nothing in that Act shall be construed so as to affect or in any way to prejudice the lawful occupation of chemists and druggists." This is proposed to be abrogated, and the words "chemists and druggists" to be omitted from the clause altogether. Clause 55 is altogether new, and to which he would request their particular attention, for, although he could not but remark that it conferred additional privileges upon the pharmaceutical chemist, it would operate prejudicially to those not members of the Pharmaceutical Society. It went on to say—"that it shall not be lawful for any person to keep open a shop for compounding physicians' and surgeons' prescriptions, unless he be a licentiate of the Apothecaries' Hall of England or Ireland, or shall have received a certificate of competency to compound medicine from either of the above bodies, or from the Pharmaceutical Society, or from some other body duly authorized in England, Ireland, or Scotland, by the General Medical Council to institute the necessary examination, and grant such certificate, and at such rate of fee as the Medical Council may sanction; and any person disobeying this provision will be liable to a penalty not exceeding £20 for each offence." It then goes on to appoint an inspector for each kingdom, who shall have power to inspect as often as they think proper all shops where medicines are compounded, and to pay these inspectors salaries such as they think fit, out of the Consolidated Fund." As he remarked before, the Chairman could not but think this a step in the right direction; but yet the great body of chemists did not want any Medical Council to regulate their proceedings. They were quite competent to appoint their own examiners, and to order the manner of their own examination; and to effect this in a proper manner he conceived the time was come when the Pharmaceutical Council must apply to Parliament for an extension of the Pharmacy Act, admitting all real *bonâ-fide* chemists, under certain regulations, and upon payment of a certain fee, to the privileges of the Society. With all deference to the United Society, he thought the present organization of the Pharmaceutical Society, the acknowledged standing it already possessed, the confidence extended to its operations by medical and scientific men, would enable it better to effect this than any other body. It was impossible that a compulsory Act like the one proposed could have a retrospective effect; it must have due regard to existing interests, as well as to the future regulations of their body. It could hardly be expected that many of those now carrying on business with credit to themselves and safety and security to the public, would be sufficiently up in the technicalities of some of the branches of science requisite to pass a satisfactory examination, and neither ought this to be expected from them. Take the chemists and druggists generally as a body, and he claimed for them as great an amount of intelligence, as great a love of science, as great a desire to keep pace in general requirements as any other class of the community, and that he thought they were quite able to take care of themselves. The last and 57th clause of the proposed Bill was one of those preposterous attempts at legislation, the gross injustice and absurdity of which, it was supposed, would ensure its immediate rejection, were it not that at times clauses equally unjust did creep into Acts of Parliament unnoticed until their effects were in full operation. It went on to say—

that no patent or proprietary medicine should be sold unless a sworn certificate of its composition be lodged with the registrar of the general Council, and a copy thereof kept open for inspection in the shop or place in which such medicine is sold; and any person selling any secret remedy shall be liable for every offence to a penalty not exceeding £20. Although a member of the Pharmaceutical Society, Mr. Hollier went on to say that he on his own part, as well as that of those not belonging to the Society, opposed such unjust, inquisitorial, and arbitrary legislation, and he doubted not but that the chemists and druggists of this kingdom would stir up such an opposition as would be sufficient to ensure the immediate rejection by Parliament of all such clauses and Acts. He apologized for having detained them so long, but thought it was absolutely necessary for their proper understanding of the several clauses of the Act, which appeared to him to have a bearing upon their interests. (Applause.)

The following resolutions were then proposed and carried:—

Proposed by Mr. Nock, seconded by Mr. Bradley, and resolved:—That this meeting views with indignation and alarm certain propositions of the Medical Council, intended to be introduced into an amended Act about to be applied for in the ensuing session of Parliament, whereby the rights and interests of Chemists and Druggists are seriously threatened and invaded, and it pledges itself by every means in its power to oppose the said propositions as an unjust and uncalled-for interference with the vested rights and privileges of the Chemist and Druggist.

Proposed by Mr. Bishop, seconded by Mr. Bell (M.P.S.), and resolved:—That this meeting, whilst thanking the United Society for the stand made by it in defence of the interests of the Chemists and Druggists, cannot but express its surprise at the apparent apathy of the Council of the Pharmaceutical Society in regard to the Bill; and, whilst recognizing the necessity of a proper educational qualification on the part of those who prepare and dispense medicines (the examination as to which this meeting, nevertheless, think should be retained in the hands of a body appointed by themselves), it requests the said Council to exert its influence to obtain the withdrawal or rejection of the obnoxious clauses proposed to be introduced into their amended Act by the Medical Council; and this meeting at the same time pledges itself to support the Council of the Pharmaceutical Society, or, in case of their inaction, of the United Society of Chemists and Druggists in any proposition for an extension of the Pharmacy Act of 1852, which shall have for its object such a qualification, together with, at the same time, the incorporation or registration of all *bonâ fide* Chemists and Druggists who may be in business at the time of the passing of such an Act.

Proposed by Mr. Owen, seconded by Mr. Garr, and resolved:—That copies of the foregoing resolutions be forwarded to the Members for the Borough for the Eastern Division of the county, desiring them to oppose in Parliament any measure which may be introduced which shall so improperly and injuriously interfere with the rights and trade of existing Chemists and Druggists and Patent Medicine proprietors.

Proposed by Mr. Bell (M.P.S.), seconded by Mr. Swinnerton, and resolved:—That copies of these resolutions, and an account of this meeting be sent to the editors of the 'Pharmaceutical Journal' and the 'Chemist and Druggist,' with a request that they will be pleased to insert the same in the next number of those publications.

Proposed by Mr. Owen, and seconded by Mr. Bishop:—That this meeting be adjourned for a month from this date; that the best thanks be given to Mr. Hollier, the chairman, for presiding at it, and that he be solicited to call a meeting of the Chemists of Dudley and its vicinity earlier, if he should deem it desirable.

(Signed) E. Hollier, *Chairman*.

[We publish the foregoing report as requested, but our readers will see by a perusal of our article on "The Proposed Medical Bill affecting Pharmacy," in the present Journal, that the Council is not supine in the matter.—Ed. Pharm. Journ.]

ORIGINAL AND EXTRACTED ARTICLES.

EXPLANATORY AND CRITICAL NOTES ON THE BRITISH PHARMACOPŒIA.

1.—Materia Medica.

First Notice.

In the first leading article of the present number of the Journal will be found a general account of the history, construction, and nature of the various changes in the new Pharmacopœia, which an Act of Parliament states "shall for all purposes be deemed to be substituted throughout *Great Britain* and *Ireland* for the different Pharmacopœias that have hitherto been in use in England, Scotland, and Ireland." As the national Pharmacopœia of Great Britain and Ireland, it is, therefore, properly termed the *British* Pharmacopœia. We propose in these notes to consider, in the first place, that part of the work which refers to the Materia Medica. The Preface informs us that "the Materia Medica contains, in its simplest pharmaceutic form, every definite medicinal substance, whether obtainable in ordinary trade or prepared by the chemical processes in the Second Part (which treats of the Preparations and Compounds), which the Committee of the Council found, on careful inquiry, to be so far approved in practice as to be entitled to a place in a National Pharmacopœia. Under each article are given :—1. A Latin Pharmaceutic Name, by which it may be prescribed; and an English Name, for use in describing the Processes in the Second Part;—2. Its Definition, together with its Chemical Symbol if it be a substance of definite composition, its Botanical Name if it be a Plant, or its Botanical source if procured from a plant; and also, in most cases, a reference to a correct Figure of the plant, and a statement of the quarter whence the article is obtained;—3. The Characters by which it may be distinguished from all other articles of the Materia Medica;—4. The Tests by which it may be ascertained to be of due strength, and free from known impurities or adulterations;—and 5. The Preparations of which it is an active ingredient."

No allusion is made in the Preface to the mode pursued in treating of the articles of the Materia Medica contained in the Pharmacopœia which are derived from the Animal Kingdom. It is possible that this may be an intentional omission, from the small number of animal substances ordered to be used; but our readers will like to be informed that a nearly similar plan is adopted with animals and animal products as with those of plants and vegetable products.

From this extract from the preface it will be seen that the part of the British Pharmacopœia devoted to the Materia Medica forms a very important portion of the volume. Altogether it comprises 156 pages, or only eighty-two pages less than the part devoted to the Preparations and Compounds. Hence, in itself, it is an epitome of the Materia Medica, and should comprise, if carefully and judiciously written, nearly everything that is absolutely essential for the medical practitioner to know, and should likewise form a very valuable foundation for the pharmaceutist to work upon. The increased importance given to the Materia Medica in the present Pharmacopœia we regard as a most important advance over preceding Pharmacopœias, and one which, we feel sure, will be cordially welcomed and appreciated by our readers.

We propose, in the first place, to direct attention to the Organic Materia Medica, and to commence by giving a list of the Plants, Animals, and their Products, which were included in the last editions of the Pharmacopœias published in the United Kingdom, but which are excluded in the present 'British Pharmacopœia;' and also a similar list of substances now introduced.

TABLE I.

Excluded Substances of the Organic Materia Medica.

Absinthium. L. E.
Acetum (Britannicum). L. E.
Acetum Destillatum. E.
Acidum Pyroligneum. E.
Alcohol. L. E.
Allium. E.
Aloe Hepatica. L. E. D.
Aloe Indica. E.
Althæa. L. E.
Amygdala amara. L. E.
Angelica. E.
Aurantii Fructus. D.
Aurantii Oleum. E. D.
Avena. L. E. D.
Bergamotæ Oleum. E.
Calamus aromaticus. E.
Canella. L. E. D.
Canna. E. D.
Carota (Radix). L. E. D.
Cassiæ Cortex. E.
Cassiæ Oleum. E.
Centaurium. E.
Chimaphila. L. D.
Cinchona Cinerea. E. D.
Cornu. L. E.
Curcuma. E.
Cydonium. L.
Cyminum. L.
Dolichos. E. D.
Elaterium (The fresh Fruit). L. D.
Euphorbium. E.
Farina. L. E. D.
Gossypium. E.
Granatum (Rind of Fruit). L.
Helleborus. L. E.
Inula. L.
Juniperus Cacumina. E. D.
Juniperus (Fructus). L. E. D.
Kino (African). E. D.
Lacmus. E.
Lactuca sativa. L. D.
Lactuca virosa. D.
Lactucarium. E. D.
Laurus. L.
Lavandula (Flores). E. D.
Linum catharticum. E.
Lupulina. D.
Malva. E.
Maranta. L. E. D.
Melissa. E.
Mentha piperita. L. E. D.
Mentha viridis. L. E. D.
Mentha Pulegium. E. D.
Menyanthes. E.
Molasses. E. D.
Morphiæ Acetas. L.
Mucuna. L. E. D.
Origanum. E.
Ossa. D.
Ovi Albumen. L.
Ovi Vitellus. L.
Ovum. E. D.
Panis. L.
Piper longum. L. E.
Pix. L. Pix arida. E.
Pulegium. L. E.
Pulegii Oleum. L.
Pyrethrum. L. E.
Pyrola. E. D.
Rhamni Baccæ. E
Rhamni Succus. L. E.
Rosæ Oleum. E. D.
Rosmarinus. E. D.
Ruta. L. E.
Saccharum commune *or* officinarum. E. D.
Sago. L. E. D.
Sagapenum. L.
Salicis Cortex. E.
Simaruba. E. D.
Spigelia. E.
Spiritus tenuior. L. E. In Part 2 of Brit. Ph.
Spiritus Vini Gallici. L.
Spongia. E.
Staphysagria. L. E.
Succinum. D.
Tapioca. E. D.
Terebinthina Chia. L. E.
Terebinthina Veneta. E.
Terebinthina Vulgaris. L.
Tormentilla. L. E.
Veratrum. L. E.
Viola. L. E.
Vitis vinifera (Fresh Fruit). E.

TABLE II.

New Substances of the Organic Materia Medica.

Acidum Aceticum Glaciale.
Aconitia.
Aconitum (Flowering Tops).
Arnica.
Beberiæ Sulphas.
Bela or Bael.
Collodium.
Conii Fructus.
Coriandri Oleum.
Cusso or Kusso.

Digitalinum.
Fel Bovinum Purificatum.
Jalapæ Resina.
Kamela.
Nectandra.
Podophyllum.
Podophylli Resina.
Sabadilla.
Santoninum.
Scammoniæ Radix.
Scammoniæ Resina.

The first list, comprising the substances of the Organic Materia Medica excluded from the British Pharmacopœia, which we have carefully compiled by comparing the present Materia Medica with the lists of the previous and last editions of the London, Edinburgh, and Dublin Pharmacopœias, will show at once that the framers of the new Pharmacopœia have been anything but sparing in their condemnation of substances derived from plants and animals. The number of articles now excluded amounts altogether to ninety-three, but as several of these, namely,—

Alcohol.
Bread,
Cotton,
Flour,
Litmus,
Turmeric,
White of egg,
Proof Spirit.
Squirting Cucumber Fruit,

are afterwards placed either in Part 2, or in the Appendix under the heads of Articles employed in the Preparation of Medicines, in Chemical Analysis, or as Test Solutions, the number of organic bodies excluded is reduced to eighty-four. Two other substances have also in previous Pharmacopœias been each mentioned under two names, as Chimaphila or Pyrola, and Dolichos or Mucuna, which reduces the number excluded to eighty-two. The plants and animals from which several previous substances of the Materia Medica were obtained are however still retained, but different parts of, or products from, are now ordered; as *Punica Granatum*, *Juniperus communis*, *Lavandula vera*, *Humulus Lupulus*, *Mentha piperita*, *Mentha viridis*, *Rosa centifolia*, *Rosmarinus officinalis*, *Ruta graveolens*, *Saccharum commune*, and *Vitis vinifera*. Further, we find amongst the excluded substances that two or more parts of the same plant or animal are enumerated in the lists of the Materia Medica; and thus, by taking all these and deducting them from the number eighty-two already arrived at, we find that the plants and animals which are altogether excluded in the present Pharmacopœia are as follows:—

Excluded Plants and Animals.

Allium sativum.
Aloe indica.
Althæa officinalis.
Amygdalus communis, var. amara.
Archangelica officinalis.
Artemisia Absinthium.
Avena sativa.
Citrus Limetta, var. Bergamium.
Calamus aromaticus.
Canella alba.
Canna species.
Cervus Elaphus.
Chimaphila umbellata.
Cinchona micrantha?
Cinchona nitida?
Cinnamomum Cassia.
Cuminum Cyminum.
Cydonia vulgaris.
Daucus Carota.
Delphinium Staphysagria.
Erythræa Centaurium.
Euphorbia species.
Helleborus niger.
Inula Helenium.
Lactuca sativa.
Lactuca virosa.
Larix europæa.
Laurus nobilis.
Linum catharticum.
Malva sylvestris.
Manihot utilissima.
Maranta arundinacea.
Melissa officinalis.
Mentha Pulegium.
Menyanthes trifoliata.
Mucuna pruriens.
Origanum vulgare.
Piper longum, *or*
Chavica Roxburghii.
Pistacia Terebinthus.
Pterocarpus erinaceus.
Pyrethrum Parthenium.

Rhamnus catharticus.
Sagus species.
Saguerus species.
Sagapenum plant.
Salix species.
Simaruba officinalis.
Spigelia marylandica.
Spongia officinalis.
Tormentilla officinalis.
Veratrum album.
Viola odorata.

In the above table we have not included the plant from which "Aloe Hepatica" is obtained, because "Aloe Socotrina" is still an article of the Materia Medica of the British Pharmacopœia, and there can be little doubt but that both kinds of aloes have a similar botanical origin, and owe their distinctive characteristics to their different modes of preparation.

The above lists show that no less than *eighty-two* substances of the organic Materia Medica lately included in the British Pharmacopœias, and *fifty-two* plants and animals, have no place in the present 'British Pharmacopœia.' This is no trifling change so far as organic bodies are concerned, and upon the whole we regard it as a useful step in the right direction, for such substances as Absinthium, Angelica, Carota, Centaurium, Cornu, Dolichos, Inula, Laurus, Linum catharticum, Melissa, Menyanthes, Origanum, Pix, Sagapenum, Simaruba, Terebinthina Chia, Terebinthina Veneta, etc., have long been almost obsolete in this country, and could consequently have no claims to be inserted in a new national Pharmacopœia. Such substances, however, as Althæa, Canella, Chimaphila, Canna, Helleborus, Lactuca, Maranta, Pyrethrum, Rhamni Baccæ, Sago, Tapioca, Tormentilla, etc., have, we think, at least equal claims for insertion as Arnica, Cocculus, Elemi, Ficus, Hemidesmus, Mori Succus, Prunum, Pterocarpus, Rhœas, Thus, Ulmus, Uvæ, etc., which are included in the present Pharmacopœia. The pruning-knife might also in certain cases have probably been exercised with benefit in other directions; thus, what advantage has been gained by retaining all the following fruits, possessing, as they do, nearly identical properties; namely, those of Anethum, Anisum, Carui, Coriandrum, and Fœniculum? or, in like manner, Benzoinum, Styrax, Balsamum Peruvianum, and Balsamum Tolutanum?

It will be seen that the majority of excluded substances were formerly in the Edinburgh Pharmacopœia. Thus we find 72 excluded from the 'British Pharmacopœia' which were formerly included in the Edinburgh; 46 excluded from the London; and 36 from the Dublin. The great majority excluded from the Edinburgh is doubtless due to the long period which has elapsed since a new Pharmacopœia has been issued by the college of that city.

If we now turn to the second table, we find only *twenty-one* new substances introduced to the organic Materia Medica, and but eight new officinal plants and animals. The number of new organic bodies alluded to in the present Pharmacopœia is somewhat increased in the Appendix, etc., where we find ox-bile, indigo, oxalic acid, pyroxylin, and a few other substances ordered, which are employed in the preparation of medicines, in chemical analysis, or as test solutions. We regret to find so short a list of new organic bodies, for several substances in frequent use might with great advantage have been introduced. We should like to see a similar plan adopted by the framers of the 'British Pharmacopœia' as has been for some time employed with great advantage in the United States Pharmacopœia,—that is, to have a Secondary List of the Materia Medica, to include all newly-introduced remedies which are upon their trial, but not sufficiently established to warrant their being placed in a prominent position in a national Pharmacopœia.

Although the number of new organic substances in the Materia Medica and Appendix of the British Pharmacopœia is but *twenty-five*, as compared with the three last Pharmacopœias of the United Kingdom, yet, when compared with the last London Pharmacopœia, the number of new bodies is increased, as will be seen by the following table:—

Table of New Organic Substances in the Materia Medica and Appendices of the British Pharmacopœia as compared with the last London Pharmacopœia.

Acidum Aceticum Glaciale.
Aconitia.
Aconitum (Flowering Tops).
Arnica.
Beberiæ Sulphas.
Bela, or Bael.
Belladonnæ Radix.
Cannabis Indica.
Chirata.
Cocculus.
Collodium.
Conii Fructus.
Cotton.
Cusso, or Kusso.
Digitalinum.
Filix.
Fel Bovinum Purificatum.
Fousel, or Fusel Oil, or Amylic Alcohol.
Gelatine (Solution of).
Glycerinum.
Hemidesmus.
Indigo.
Jalapæ Resina.
Kamela.
Laurocerasus.
Lini Farina.
Litmus Paper, Blue.
Litmus Paper, Red.
Litmus Tincture.
Matico.
Nectandra.
Ox Bile.
Oleum Myristicæ.
—— Cubebæ.
—— Coriandri.
Oxalic Acid.
Oxalic Acid (Volumetric Solution of).
Podophylli Resina.
Podophyllum peltatum.
Pyroxylin.
Sabadilla.
Saccharum lactis.
Santonica.
Santoninum.
Scammoniæ Radix.
Scammoniæ Resina.
Spiritus Pyroxylicus Rectificatus.
Tartaric Acid (Solution of).
Terebinthina Canadensis.
Turmeric Paper.
Turmeric Tincture.

The above sketch will at once enable our readers to see the great changes which have been effected in organic substances in the British Pharmacopœia. In a general glance over its pages we notice several errors, two of which, from their importance, we shall now allude to; thus, under the head of OLEUM CROTONIS, we find that "the Oil expressed from the seeds in England" is ordered to be used; and the following is given as the test:—"Agitated with its own volume of alcohol, and gently heated, its forms a clear solution, from which about three-fourths of the oil separate on cooling." This test is about true as regards East Indian Croton Oil, but it is not true with English Croton Oil, which is wholly and readily soluble in alcohol, and the solution thus formed is permanent at ordinary temperatures. Under the head of Tinctura Aconiti, it is stated that "this tincture has *half the strength* of Tinctura Aconiti, *Dub.*, and one-third of the strength of Tinctura Aconiti, *Lond.*" This is an error; it should be as follows:—This tincture has *one-fourth the strength* of Tinctura Aconiti, *Dub.*, and one-third of the strength of Tinctura Aconiti, *Lond.*

In our next number we shall give critical and explanatory notes of such articles of the organic materia medica as may require them. We forbear, until our notices are concluded, from expressing any positive opinion upon the manner in which this portion of the work has been executed, but at the same time we cannot but express our belief that it will be found the most perfect and best part of the British Pharmacopœia.

DUTIES OF MASTERS AND APPRENTICES.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—Having read in the 'Pharmaceutical Journal' of last month the letters of "M. P. S.," etc., on the above subject, I trust I shall not digress too much on

your space to say a few words on the subject; and at the onset I would ask, whether the same motives prompt the man who sends his son from home to obtain a business knowledge, as those of the master who takes him? I fear not: in too many instances, with the latter, it is a question of cheap labour, rather than to impart the necessary education of the apprentice. Again, many youths are taken for the sake of the good round premium advanced by way of a set-off to the incumbrance his presence oftentimes engenders. I think, if the capacities of youths were better studied, and they were employed according to their adaptabilities, we should see a more brilliant class of pharmaceutists; anyhow, the natural bent of every one's inclination should be considered. It is very uphill work for a thick-headed or daft lad to comprehend the ins-and-outs of a chemist's business, whilst he might do very well for other trades requiring less brain-work. Druggists' apprentices are often consigned to the back-slums to stir up "filthy messes," clean bottles, etc., for the first two years or so; sometimes, to the more exalted position of errand-boy. It may *read* very well when "M. P. S." speaks of treating pupils as "own sons" or as members of the family, but at the present money-grubbing day it is more than we can expect of human nature to take cognizance of; it is to the *interest* of masters to treat their apprentices kindly, also to make them worth their salt as soon as possible, and to keep an eye upon their doings; but beyond this all must depend upon the individual exertion of the apprentice. I think we shall find usually that it is *after* the period of apprenticeship the greatest strides in chemistry, botany, and general scientific knowledge are made. My own case, which is that of "a poor country lad," who knows but little of aught, backs up this opinion.

I do not think the "relaxation" allowed by "M. P. S." to be worthy of the name; the "object in view," of which we hear so much generally, should be sought for by the assistants rather than by employers. I have a friend who magnanimously sends his young men for a walk (not into "town") for the benefit of their health and his own pocket, the latter taking precedence; this is not fair sailing, the "object in view" is seen through, and the good intention pronounced humbug.

It is within the grasp of most young men to attain the superior position of "Pharmaceutical Chemist." Year by year the well-informed public will increase its recognition of the qualification; so that it behoves all young chemists to be up and alive to the fact, or they will be pronounced not of the right sort.

I am, etc.,

Wetherby, December 13, 1863. JAMES HOULTON.

THE DUTIES OF MASTERS AND APPRENTICES.

"Quot homines tot sententiæ."

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Dear Sir,—The chemist's apprentice would indeed be an "ingrate extraordinary" to his calling, did he not rise to defend himself from the merciless shaft levelled at him by Mr. Gissing, and likewise to thank the warm advocacy of a "Paterfamilias." Allowing that some unhappily have been compelled to choose between a "bacon-factor's life" and that of a "grocer," and that eventually the "fickle goddess" has intervened on their behalf, and destined them to "assume the toga" in a chemist's shop; yet such an indirect course has not been pursued by all; but some, on the contrary, have enjoyed a fair grammar-school education, which in these days is considered essential to one's success either in the professional or the commercial world. There are many also entering on the duties of a chemist, to whom Horace and the like are familiar, and yet to whom the phrase "pro re natâ" (on a prescription care-

lessly lying on the counter) might form a stumbling-block ere its free translation was arrived at. Then as regards him who cannot strictly be regarded as an "embryo," I would say that although exceptions "have occurred" where he who has had the rare opportunity of taking botanical excursions with his master, and also of receiving the latter's kind assistances in the laboratory, and after all has rejected and despised them, yet there are very many who would be only too glad to embrace the "truly exceptional opportunity" and heap coals of heartfelt gratitude on the head of the "generous Timon." Trusting that the spirit of indignation at being thus opprobriously descanted upon may excuse these few remarks,

I am, Sir, most faithfully yours,
A Registered Apprentice.

December 6, 1863.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—The real answer to the question why pharmaceutical chemists bear so small a proportion to the chemists and druggists in general, lies, in my opinion, in a few simple facts. There is *no inducement*, either in the form of a higher rate of salary, *or any* other advantage offered to those assistants who have passed the examinations of the Society than to those who have no other knowledge than that which they have acquired by actual business experience. As far as I am able to judge from my own case, I can say that unqualified assistants stand equally well situated with regard to obtaining good employments as their more scientific brethren (in some instances, I believe, better). This state of things certainly accounts, to a great extent, for the small number of Associates, as it is not very probable that young men will put themselves to the expense and trouble of passing an examination, the advantage of which is so shadowy, and the outlay so doubtful of receiving an adequate return. Certainly the utility of the Society's education is not clearly apparent in the case of a chemist, whose business consists in the preparation of sheep ointment and wheat-dressing, diversified with the sale of Horniman's tea, British wines, and various other sundries; and to most people unconnected with the profession, the idea of such a man qualifying himself to pass an examination in the higher branches of chemistry and pharmacy might appear almost an absurdity, and perhaps calculated to destroy his utility by disgusting him with his own humble class of business. Many employers very naturally object to engaging an assistant whose scientific knowledge is more extensive than their own, as it soon causes jealousy on one side, and greater or less contempt on the other, soon followed by mutual unpleasantness and separation. This I know to be the case. Let us take another view of the case. Suppose assistants anxious to study, and perfectly willing to qualify themselves for the Minor or Major, what time, under the present state of business, have they at their disposal to devote to such purposes? or what employer would find time for them to study? Would he not rather consider himself defrauded of his just services, due for the miserable pittance he bestows for long hours of labour, commencing at seven o'clock in the morning, and continuing without intermission or relaxation until ten or eleven at night, and through seven days in the week? Fortunate is the assistant who can even obtain six hours during that period for recreation, and in which time he is really incapable of study even if he had the inclination. For my part, I do not believe that any man could devote himself to study after being engaged for fourteen hours in a monotonous and wearying employment, more especially when the objects of study are connected with the pursuit to which he has been applying himself during the whole of the day. Is it not more natural that a man should give his body and mind that rest and relaxation so necessary after a day of unremitting toil?

It is my opinion that until the relations between employer and *employés* are altered, and we receive a treatment more thoughtful and considerate than that which is the present characteristic of the business,—till that time things will remain in their present state, as the initiative must commence with the masters, and we shall gladly show ourselves willing to accept the advantages offered, and to make an adequate return for them; but for men to expect that we can work the whole of the day, study for an hour, go to bed, and go through the same routine day after day, is monstrous, and shows a want of knowledge of human nature of which any sensible man ought to be ashamed. I am thankful that I have not quite become a mere machine, a result to which the present system is rapidly driving us. I remain, Sir, very obediently yours,

FRANK VINCER.

Sevenoaks, Dec. 10, 1864.

LOCAL EXAMINATIONS.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—The letter of Mr. Reynolds on Local Examinations, in the Journal for January, is so important in its suggestions and bearings, that it should be noticed approvingly by all who have the interests of our Society at heart. The period through which we are now passing is one pregnant with importance to our trade, and demanding from our Council a wise, firm, and discriminating course. With the efforts of the United Society on the one hand, and the Medical Council on the other, with a new Session of Parliament immediately before us, and the issue of a national Pharmacopœia, there is need of great prudence and discretion also on the part of pharmaceutical chemists; and on those combined, will, I believe, mainly depend the issue whether there shall result from it that position and status for the chemist which the importance of his calling deserves, or whether we shall go further back towards that free trade in drugs in which some seem so much to delight. It behoves the Pharmaceutical Society to strengthen its position in every possible way, and to secure, in view of the coming struggle, the greatest accession of numbers; and one of the most efficient means to secure this end would be, I believe, the institution of local examinations.

Probably the experience of many will bear out that of my own, that having by the diligent improvement of the little time at the disposal of our apprentice or assistant prepared for the examinations, having had no help from teachers or schools, it appeared a most formidable undertaking to go up to London and face the Board of Examiners there; and had a local examination been available nearer at hand, how much trouble it would have saved us, and how much sooner should we have put our knowledge to the test. And I believe that there are many now who, if the examinations were brought nearer home, would be glad to attempt them, and who would thus become fully identified with our Society, instead of being lost to us as they are now. Of the best means of carrying out these examinations, men of greater experience than myself in such matters should speak. I am disposed to think that, at the outset at least, an arrangement for the Minor Examination would suffice, and for this surely men could be found willing and able to undertake the office of examiners, with the sanction of the London Board; or if, as Mr. Reynolds prefers, both examinations should be made "Local" at once, the system of examination papers would meet the case: if such an arrangement is found sufficient for university degrees, for masters' certificates, for middle-class examinations, surely it may be adapted to the requirements of the Pharmaceutical Society. If those who

are possessed of most experience among young men in our profession will speak out on this point, I believe they will all agree that the institution of accessible and reasonable examinations (under the bye-laws of our Society), in the country, would do more than anything that has been urged of late years to promote its interest and prosperity: it would lessen the plea of expense, it would keep up the interest of apprentices and assistants in the Society, and it would constantly remind the masters of their duty to themselves, their calling, and their pupils.

I am, Sir, yours obediently,

W. Judd,

Pharmaceutical Chemist, Certificated Teacher of Chemistry and Botany, Science and Art Department.

Christchurch, January 22, 1864.

ANALYSIS OF CHINCHONA BARK AND LEAVES.

From W. G. M'Ivor, Esq., Superintendent Government Chinchona Plantations, to the Secretary to Government, Fort Saint George.

Ootacamund, 3rd October, 1863, No. 91.

Sir,—1. I have the honour to forward by baughy a box containing further supplies of chinchona bark and leaves, as per list annexed, to be submitted to Mr. Howard for further analysis and report.

2. The bark and leaves now forwarded were removed from the plants during the rains, or the season of the year when the sap is in full flow, being the period when the plants contain the greatest proportion of moisture.

3. The object in submitting these specimens is to ascertain how far this condition affects the yield of alkaloids. The last supply of bark submitted to analysis by Mr. Howard was cut when the sap was beginning to rise.* A further supply will be forwarded in the dry season, when the plants are at rest, and this, I trust, will be sufficient to enable Mr. Howard to form an opinion of the most advantageous time of collecting the bark. It, however, occurs to me that the bark should either be cut in the middle of the dry season or in the spring, as the sap is beginning to rise; these seasons are also most favourable for drying and preserving the bark.

4. The plants under cultivation have given unmistakable signs that they do not require so moist a climate as they are represented to enjoy on the Andes. This season at Neddivuttum has been unusually wet, and several of the Grey-bark plants have suffered in consequence. The way in which the continuous rain seems to affect the plants is by throwing a constant stream of water down the channels of the leaves, which, resting in the axil, causes the bark there to decay; this decay is communicated to the young growing wood, and ultimately to the pith; the decay having once reached the pith, the rainwater finds its way into the centre of the stem, and in this way affects the health of the plant. A specimen of the wood of *Chinchona micrantha* is forwarded for Mr. Howard's opinion on the subject. The Red bark, Crown barks, and Yellow bark do not suffer from this cause, apparently because the petiole of the leaf in these species is more rounded, and, consequently, it does not conduct and deposit the water in the axil of the leaf, as in the case with the Grey barks.

Specimens of Chinchona Barks, etc.

No. 1. *Chinchona succirubra*, Red Bark from plants of twenty-two months' growth.
2. *C. succirubra*, Red Bark from plants of eighteen months' growth, thickened by being covered with moss for three months.
3. *C. succirubra*, Red Bark from branches of eighteen months' growth and under.
4. Renewed Bark of *C. succirubra*, the centre part being the bark renewed a second time.
5. Red Bark from small branches broken by the wind.
6. *Chinchona micrantha*, bark from a plant of eighteen months' growth.

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* Pharm. Journ. vol. iv. 2nd ser. p. 70.

No. 7. *C. micrantha*, bark from upper part of plant of eighteen months' growth injured by the rains.
8. *C. micrantha*, bark from branches broken by the wind.
9. *C. Pahudiana*, grown in open ground.
10. Green leaves of Red Bark dried in the shade.
11. Green leaves of *Chinchona officinalis* dried in the shade.
12. Green leaves of *C. micrantha* dried in the shade.
13. Specimen of wood of *C. succirubra*, showing the injury done by the continued rains.

(Signed) W. G. M'Ivor,
Superintendent.

REPORT ON THE ABOVE BARK AND LEAVES SENT HOME IN OCTOBER, 1863, FOR EXAMINATION, BY J. E. HOWARD, ESQ.

From J. E. Howard, Esq., to the Under-Secretary of State for India, December, 1863.

Sir,—The box of specimens reached me in good condition, and has furnished valuable materials for further research, although the quantity of bark sent this time amounted to but a few ounces in weight. Several pounds weight of leaves (well-dried and with a marked tea-like fragrance) have allowed me the opportunity of following various lines of experiment, in order to ascertain their probable commercial value. I regret to be obliged to confirm the opinion I expressed in my last, that the leaves will not supply material for the extraction of *Quinine*, although the quantity of the first rough precipitate from an acid solution, having the appearance of a hydrated alkaloid, is considerably more than I succeeded in obtaining before, being equal to 1·31 per cent. of the weight of the leaves. Of this, a small portion was soluble in ether, to the extent of 0·17 per cent., forming a clear yellow solution, which precipitates on the addition of a solution of oxalic acid in spirit of wine. Nevertheless, the further prosecution of the inquiry, and the attempt to purify the alkaloid, showed me clearly that I had to do with a state of things very different from that which exists in the bark, and that I should not succeed in obtaining an available salt of Quinine. I hope to be able to prosecute this research on a still larger quantity of the material, in order to test the conclusions to which my present investigation tends. The alkaloid exists in the leaves in very intimate relationship with the green colouring-matter. This latter substance is well deserving of a more elaborate investigation, as it seems to be somewhat analogous to indigo, and its ethereal solution has a peculiar effect on the rays of light; the reflected ray having almost a blood-red colour, whilst the transmitted ray is a fine green.

I will now notice the remaining specimens. Nos. 1 and 2, though presenting a promising appearance, were in too small quantity to justify examination. No. 3, "Red Bark from branches of eighteen months and under," yielded me not less than 6 per cent. of rough alkaloid, but of this a larger proportion seemed to be *Quinidine* and *Chinchonidine;* but as I had little more than an ounce of bark to examine, I cannot consider this comparative result as an ascertained fact. As these barks were cut at the period when the sap is in full flow, it is not at all improbable that the alkaloids may vary somewhat from those produced at a different season. The above 6 per cent. of alkaloid yielded in a state of further purification 4·10 per cent. of *Quinidine, Chinchonidine,* and *Quinine*, and also a portion, 0·9 per cent., insoluble in ether; in all, 5 per cent. The portion insoluble in ether, and not capable of being crystallized from spirit, I set down as *Chinchonicine*, and not pure *Chinchonine*, of which last I find but few indications in these young barks. The *Quinidine* crystallizes as hydriodate, and the *Chinchonidine* as a resinous mass, when united with hydriodic acid. Both form a feathery crystallization as sulphates.

No. 5, "Red Bark from small branches broken by the wind," gave a result very nearly resembling the analysis of the leaves. This is not surprising, considering the very immature state of these succulent branches. I obtained 1 per cent. of alkaloid soluble in ether, which gave a doubtful trace of crystallization as sulphate. A further portion of impure alkaloid insoluble in ether resembled the same substance as described under No. 3.

The No. 8, *Ch. micrantha* bark, from small branches broken by the wind, gave, on examination, more chincho-tannic acid than No. 5. The precipitated alkaloids appeared to be, as above, 1 per cent., but of this 0·40 per cent. proved to be oxidized tannin, and

insoluble in ether. The rest in part crystallized from ether, and in part formed a quinine-like mass. The crystalline portion formed crystals as hydriodate, indicating the *Quinidine* of Pasteur. The total proved to be *Quinidine* (*Quinine?*) and a trace of *Chinchonine*, 0·60 per cent.

No. 9, *Ch. Pahudiana*, contained more chincho-tannic acid than even the last. The precipitate of alkaloid was minute, and much implicated with astringent colouring-matter. Ether dissolved a small portion, in which, on evaporation, crystals could be perceived. This bark, in the state in which sent, has scarcely any bitter taste, and would be worthless in commerce. I cannot say what the mature bark might be after some years' growth, but doubt whether it can ever repay the expense of cultivation. I may remark that this bark a good deal resembles that of *Ch. purpurea* in its external appearance; and also, that the bark of *Ch. micrantha* now sent has much the same character as that which characterizes the bark of the same Chinchona as grown in South America.

I find similar characteristic colouring in the leaves of the three species sent, *Chinchona officinalis*, *micrantha*, and *succirubra*. The same also seems (a little altered) to pervade the specimen of wood, marking a difference from the heart-wood of *Ch. succirubra* of many years' growth which I have before examined.

I have the honour to be, Sir,
Your obedient servant,
JOHN ELIOT HOWARD.

ON PURE METHYLIC ALCOHOL

BY EMERSON J. REYNOLDS.

Read before the Royal Dublin Society.

A somewhat lengthy discussion has recently been carried on in the pages of some chemical and pharmaceutical periodicals, relative to the best method of "cleaning," or rendering inodorous, the ordinary "methylated spirits," in the course of which it has been suggested that in all probability perfectly pure methylic alcohol is as free from all disagreeable odour as the ordinary spirits of wine, even though the chemical text-books state the contrary. As, in the course of some experiments, it became necessary for me to prepare some perfectly pure methylic alcohol, it may not be uninteresting at the present time if I state briefly my experiences with it.

The source from which I proposed to obtain the pure alcohol was the oxalate of methyl. This salt was prepared as follows:—

The purified naphtha was distilled as long as the boiling-point remained steady at 176° F. Equal weights of the distillate, oxalic, and sulphuric acids were now rapidly distilled, and the resulting oxalate crystallized from the liquid which collected in the receiver. The ether was then dissolved in alcohol and again crystallized; the product from the last operation was then rectified from oxide of lead, and finally twice recrystallized from alcohol. The resulting pure oxalate of methyl was then decomposed into oxalic acid and methylic alcohol, by two different modes of treatment: 1st. By the action of hydrate of potash in excess, and subsequent distillation; 2ndly. By the prolonged action of water alone in a close vessel, and employing a moderate temperature; this product was likewise distilled; the reaction which takes place in each instance being according to the following equations:—

$$(1.)\ \left.\begin{matrix}(C_4O_4)''\\(C_2H_3)_2\end{matrix}\right\}\qquad \left.\begin{matrix}K\\H\end{matrix}\right\}O_2 = \left.\begin{matrix}(C_4O_4)''\\K_2\end{matrix}\right\}O_4 + 2\left.\begin{matrix}C_2H_3\\H\end{matrix}\right\}O_2.$$

$$(2.)\ \left.\begin{matrix}(C_4O_4)''\\(C_2H_3)_2\end{matrix}\right\}O_4 + 4HO = \left.\begin{matrix}(C_4O_4)''\\H_2\end{matrix}\right\}O_4 + \left.\begin{matrix}C_2H_3\\H\end{matrix}\right\}O_2.$$

The dilute methylic alcohol thus obtained was then rectified from lime, and both specimens found to possess the following properties:—As thus prepared, it is a mobile inflammable liquid of low boiling-point, having a distinct and peculiar, though not disagreeable odour, quite different from that of ordinary alcohol, and a burning taste. No compound is formed with oxide of mercury soluble in potash. Finally, when treated with powdered hydrate of potash, and allowed to remain in contact with it for twenty-

four hours, the mixture had not become in the least coloured, proving, as I think, that the action of Ure's test for pyroxylic spirit depends on the presence of one or other of the impurities usually existing in wood naphtha, and not on any power which the alkali possesses of decomposing the methylic alcohol itself.

ON THE DECORTICATION OF CEREALS.

What is understood by the decortication of grain? It is a system by which the exterior envelope is taken off, so that there remains only the kernel of flour; in other words, decortication does to the grain what most persons do to fine fruit before eating, namely, they peel it, in order that the bitterness or coarseness of the skin may not diminish the flavour and goodness of that which is within.

Thus, decorticated grain is without the bitterness which the skin communicates, whether it be for making bread or for distillation; in fact, any one who has not tasted bread made from decorticated corn does not know the natural taste of wheat flour.

Corn is the most valuable of the farinaceous foods of man, and it is important to know if the flour of old corn can be improved by decortication. Look, then, to the structure of a grain of corn, beginning from the outside. We find a gummy and resinous pellicle in order to protect the grain, at the same time not stopping the power of absorption, and it is easy to understand that this pellicle easily gets discoloured and charged with dust that must impart a bad taste; after this pellicle there is a thinner skin, distilling the air and nourishing the kernel as through a thin veil. There is a third envelope, formed of impalpable dust, which acts as a sponge, absorbing the damp and stopping putrefaction, and giving a longer life to the kernel. These three envelopes form the brans, and under these three there is a thin skin, called in science "testa." This skin sticks to the floury kernel, and surrounds it like a cuirass, and the object of the decorticator is to take off this cuirass, and strip it completely without injuring it.

After the testa we come to the germ of the grain, which surrounds the kernel like a crown, enlarging it towards the embryo. This is the flour *par excellence*. Then come the particles the most glutinous, then the centre.

One can understand that in completely taking off the three brans of old wheat, or of Egyptian wheat, before grinding, the flour will necessarily be better. If the three brans be preserved separately, the inner one will be found in the form of a fine, black, bitter, bad-smelling dust.

What advantages, then, are to be obtained by decortication?—The answer is 10 per cent. increase in quantity of flour (at least upon wheat), and from 12 to 15 per cent. in barley and oats, and at the same time a finer colour and a better taste. The next question which arises is, "Ought the grinding of decorticated grain to be done in the same manner as undecorticated grain?" The answer is, "No." Having shown that the finest flour for taste and nourishment adheres to the skin, the grain must be pulverized to detach this flour from its envelope. You must then grind as fine as possible, so as not to heat the flour, then dress through a dressing machine, of which the coarsest silk will not let through more than the third or fourth degree of fineness,—thus you will obtain 80 per cent. of the weight of corn; then you will either regrind or redress the remainder, so as to have 90 parts of flour from 100 parts of the corn decorticated. The 90 parts of flour will make a delicious and nourishing bread.

As to decortication in a hygienic point of view, the flour of decorticated corn at 90 per cent. is more nutritious than ordinarily ground corn at 78 or 80. All the chemists (in France) who have analysed and compared flour from decorticated and undecorticated corn, find 5 and 6 per cent. more gluten in the former than in the latter. The formation of the grain shows us that it must be so. In grinding undecorticated grain, to prevent the third bran from spoiling the colour of the flour, the stones are put so far apart that a large portion of the flour is suffered to escape in the brans, and we have seen that the exterior flour is richest in gluten and in phosphoric principles.

As in the ordinary millering, the greater part of this excellent flour is left in the bran, so flour from undecorticated corn extracting 78 to 80 per cent. of the weight of the corn, is inferior in nourishment and in flavour to the flour of decorticated corn extracting 90 per cent. of the natural weight of the corn.

As regards the several qualities of bread, the decortication does not affect the different qualities that exist in the flour; the compartments of the dressing machine divide it, and one can always have bread more or less white according as the 1st, 2nd, or 3rd flours are more or less mixed. The quality of the first will be incomparable, but what is gained in whiteness is lost in taste and nourishment. Thus, we say, the first flour will only be used for pastry and very fine bread—it will be excluded from the table where bread is the principal food—and will be only used at the table of the luxurious.

It is better to make a quality with all flours united, making a wholesome and well-flavoured bread; and experience has proved that young people, more especially, fed with this bread will have a strong and vigorous constitution, instead of the lymphatic blood produced by the white and tasteless bread in common use.

In order to obtain this complete decortication, the principle adopted by M. Poissant (the pioneer of this system) is that of causing a continuous rubbing of grain against grain by means of a well-devised machine,—the result of many years' toil, but which it is hardly possible to describe here. Suffice it to say that it consists of two sets of revolving blades, driven at 300 or 400 revolutions per minute, which causes the grains to come into contact with each other in such a manner as to create a speedy expansion and separation of the skin, and as each skin is loosened, so is it driven off at stated and fixed periods by an arrangement of fanning.

It is necessary to observe that the grain, previous to decorticating, is immersed for a second or two in cold water, and allowed to drain for four or five minutes before it is put into the hopper of the machine. The next step before grinding is to take care that the grain is thoroughly dried, which is easily accomplished by rapid currents of heated air meeting the grain as it passes from the machine, it being observed that the moisture, through its immersion, is exceedingly slight, and altogether superficial.

It is a matter of singular yet great importance to know that corn and other cereals decorticated are not likely to be attacked by that destructive insect the weevil, that is, if the decorticated corn is carefully excluded from sunshine. Thus to preserve decorticated corn, after it is properly dried, it should be put into barrels, or stored in close and air-tight granaries, where it will be found to keep for an indefinite period.

By way of recapitulation it may be stated,—

1st. That decorticated grain will always be profitable to the world, as it incontestably yields 10 to 12 per cent. more flour than ordinary millering.

2nd. It can be done in either small or large quantities, and not only produces from 10 to 12 per cent. more flour, but at the same time from 5 to 6 per cent. more glutinous nourishment.

3rd. Its non-susceptibility of attack from the weevil, and therefore its fitness for storing against periodical seasons of scarcity.

Lastly. The machines are simple, cheap, lasting, and capable of being worked either by hand or motive power at small cost, and have, in fact, no known drawbacks, except that pollard bran, etc., which is produced by the present method of millering, will no longer be an article of commerce. But as a set-off, the pellicle which is produced by the new system is found to make an excellent vellum-like paper, which is largely sought after in France by bookbinders.

The above is based partly on personal observation and examination, and partly from written communications from M. Poissant, whose whole life nearly has been devoted to this subject.—*C. Davison, C.E., at the British Association.*

THE TOOT-POISON OF NEW ZEALAND.

BY W. LAUDER LINDSAY, M.D. AND F.R.S. EDIN., F.L.S., ETC.

During a tour through the New Zealand provinces in 1861–62, the writer was struck with the abundant evidences which everywhere presented themselves of the ravages produced among the flocks and herds of the settlers by the *Toot-plant*, one of the most common indigenous shrubs of those islands. In many cases of losses by individual settlers brought under his notice, the amount from this source alone had been from twenty-five to seventy-five per cent. In Otago particularly were such losses felt during the height of the gold

mania, from July to December, 1861: the traffic between Dunedin and Tuapeka gold-fields requiring the service of large numbers of bullocks, a great proportion were lost by Toot-poisoning. In colonies which as yet, at least, have depended for their prosperity almost solely on pastoral enterprise, such losses form a material barrier to prosperity; and the concurrent testimony of the colonists in every part of New Zealand proves the great desirability of determining the nature of the Toot-poison, the laws of its action on man and the lower animals, and its appropriate antidotes or modes of treatment. With a view to assist in the attainment of these aims, the writer had made notes, on the spot, of a large number of instances of the poisonous or fatal action of the plant on man—adults as well as children—and the lower animals, and had brought specimens home for chemical examination. The chief results of his investigations may be thus stated:—

1. The Toot-poison belongs to the class of *Narcotic-irritants*.

a. Its action on man includes the following symptoms:—coma, with or without delirium; sometimes great muscular excitement or convulsions, the details differing in different individuals; during convalescence, loss of memory, with or without vertigo.

b. In cattle and sheep, they include vertigo, stupor, delirium, and convulsions; curious staggerings and gyrations; frantic kicking and racing or coursing; tremors.

2. The poisonous portion of the plant,

a. To man, is generally the *seed*, which is contained in a beautiful, dark purple, luscious berry, resembling the blackberry, which clusters closely in rich pendent racemes, and which is most tempting to children; occasionally the young *shoots* of the plant, as it grows up in spring.

b. To cattle and sheep, in almost all cases, is the young *shoot*, which is tender, and succulent, resembling in appearance and taste the similar state of asparagus.

3. The following *Peculiarities* exist in regard to the action of the Toot-poison:—

a. A predisposition must exist, such predisposition being produced in cattle and sheep by some of the following conditions or circumstances:—The animal is *not habituated* to the use of the plant; it suddenly makes a large meal thereof after long fasting, or long feeding on drier and less palatable materials, or after exhaustion by hard labour, or hot dry weather. From some such cause the digestive system is deranged, and is susceptible of more serious disorder from the ingestion of food to which the animal is, at the time, unaccustomed. Hence Toot-poisoning frequently occurs in animals which have just been landed from a long and fatiguing sea-voyage, during which they have been underfed or starved, to whom the young Toot-shoots present the most juicy, fresh, pleasant diet.

b. On the other hand, the same kind of animals, *habituated* to the use of the Toot-plant, not only do not suffer at all, but for them it is regarded as quite equal in value to, and as safe as, clover as a pasture food. It is an equal favourite with cattle and sheep, whether they have been habituated or not.

c. The predisposition in man is probably produced by analogous conditions depressing the tone of his nervous and digestive systems, or directly deranging them. *Children* are affected out of all proportion to *adults*.

d. Adults who have suffered from the poisonous action of Toot under certain circumstances have been exempt from such action under certain others,—the same parts of the plant having been used, and apparently in the same way, in both sets of instances. Moreover, the Toot-berries enjoy, both among the Maoris and colonists, an enviable notoriety on account of the agreeable and harmless wine and jellies they are capable of yielding, the former whereof especially has long been greatly prized. The *seeds*, however, in these cases probably do not enter into the composition of the said wine and jellies.

4. The current *Remedies* for Toot-poisoning among the settlers are, in regard to—

a. Cattle and sheep—mainly bleeding, by slashing the ears and tail. Belladonna has been variously tried, and favourably reported on; by others, stimulants are regarded as specifics (carbonate of ammonia, brandy, or a mixture of gin and turpentine, locally known as "Drench"). Whatever be the nature of the remedy, there is no difference of opinion as to the necessity for the promptest treatment, since, at a certain stage of the action of the poison, *all* remedies appear equally inefficacious.

b. In man, the nature of the remedy is still more varied, though emetics and stimulants seem the most rational of those usually had recourse to.

5. The *Toot-* or *Tutu*-plant is the *Coriaria ruscifolia*, L. (the *C. sarmentosa*, Forst.). The plant is variously designated by Maoris and settlers in different parts of the New Zealand islands; and this of itself indicates how familiar it is, and how abundantly and widely distributed. The genus *Coriaria* is a small one, and, if not belonging to a subdivision of the Natural Order *Ochnaceæ*, probably represents a separate Order closely allied thereto and to the *Rutaceæ*. The most distinguished botanists, however, are at issue as to its precise place and alliances in the vegetable system. They are in similar dubiety as to the *species* of the genus, and the *varieties* of the species *C. ruscifolia*, L. In New Zealand there appear to be at least three *Coriarias*, which some botanists regard as mere varieties of *C. ruscifolia*, L., and others consider separate species. The writer had made, in July, 1862, an examination of all the species of the genus *Coriaria* contained in the Hookerian and Benthamian Collections at Kew, the result whereof was a strong conviction of the necessity for a critical revision of the whole genus, throughout all its species, wherever distributed. The writer considers the specific names of the Toot-plant (both *ruscifolia* and *sarmentosa*) objectionable, as not truly applicable or descriptive; and proposes the specific term *C. tutu*, the Maori name of the plant, as more convenient to indicate the *type* of the species, leaving such terms as *ruscifolia*, *thymifolia*, and *sarmentosa*, to represent varieties or other species, as a subsequent critical examination of the genus may render necessary or desirable.

In contrast to, and in connection with the toxic action of *C. ruscifolia*, the writer may remark on the better-known poisonous properties of *C. myrtifolia*, familiar as an adulterant of senna, and on those of other species of the genus *Coriaria*.* He announces his belief that the whole genus *Coriaria* must be considered endowed with poisonous properties, probably of the narcotico-irritant class, and that, as such (especially in reference to the extent and importance of the economic losses caused by such species as Toot), it is eminently deserving of thorough scientific investigation.

Under this head he may point out the fact that—

a. While certain animals seem to be themselves exempt from, or insusceptible to, the action of the poison, they may, by feeding upon certain species, or certain parts of some species of *Coriaria*, and thereby assimilating or secreting the contained poison in their tissues, communicate poisonous effects, or become poisons, to man or the lower animals, to which they (the animals first mentioned) have become articles of diet. He would cite a recent instance in connection with *C. myrtifolia*, in which several persons near Toulouse were poisoned by a dish of snails which had been fattened on its leaves and shoots.

b. That Royle in reference to the fruit of *C. Nepalensis*, Peschier, of Geneva, in regard to *C. myrtifolia*, and other authorities in regard to other species of *Coriaria*, have published instances of their *harmless* or even *beneficial* effects, under certain circumstances, on man or the lower animals. Such conflicting statements would appear to indicate that there are peculiarities in the action of the poisonous principles of all the *Coriarias*, or discrepancies in the records of instances of the said action, which discrepancies or peculiarities demand reconciliation or explanation at the hands of competent scientific experts.—*Proceedings of the British Association.*

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* *Coriaria myrtifolia* is known in New Granada under the name of the "Ink-plant," and the following letter respecting it, from Dr. Jameson, of Quito, was read recently at a meeting of the Linnean Society:—

"I am anxious to have Dr. Hooker's opinion of the 'Ink-plant.' There is a tradition here respecting this vegetable-juice that merits attention. It happened, during the Spanish Administration, that a number of written documents, destined to the mother-country, were embarked in a vessel, and transmitted round the Cape. The voyage was unusually tempestuous, and the documents got wetted with salt water. Those written with common ink became nearly illegible, whereas those written with 'Chauchi' (the name of the juice) remained unaltered. A decree was thereupon issued that the Government communications should in future be written with the vegetable juice. . . . I do not vouch for the correctness of this statement, but I have constantly heard it repeated from different sources. I generally use this ink in preference to the commercial article, as it is not so apt to corrode the steel pen. The present note is written with it, and has no admixture whatever, being only yesterday expressed from the fruit. When newly written, its colour is reddish, becoming black after a few hours."—Ed. Pharm. Journ.

TEST FOR MURIATE OF CINCHONINE.

A few weeks ago, a sample stated to be sulphate of quinidine, and offered for sale at a remarkably low price, was given me to examine as to its purity. To my astonishment, not a grain of quinidine could be detected, and the sample turned out to be pure muriate of cinchonine. The easier the means to find out such a fraudulent substitution the better, and as a very simple and convenient test, I would recommend to heat a few grains of the suspected article carefully on a platinum foil. Muriate of cinchonine, also the muriates of quinine and quinidine, fuse and give off, if ignition is avoided, purple fumes, very much like the vapour of iodine. The sulphates of the cinchona alkaloids, and the alkaloids themselves, do not give this remarkable reaction. In sulphate of quinine an admixture of twenty per cent. of muriate of cinchonine can thus in a moment be detected. Should the reaction be doubtful, as it will be when only five or ten per cent. of muriate of cinchonine are present, the easiest method is then, of course, to test for hydrochloric acid in the usual way, by dissolving a few grains in pure dilute nitric acid, and adding a few drops of solution of nitrate of silver, which reagent ought neither in the solution of pure sulphate of quinine, nor in that of pure sulphate of quinidine, produce the least precipitate. U.

AMERICAN PHARMACEUTICAL ASSOCIATION.

The eleventh annual meeting of this Association commenced its sessions at the Hall of the University of Maryland, Baltimore, on Tuesday, Sept. 8th, 1863. Delegates were appointed to attend the Meeting from the Massachusetts College of Pharmacy, New York College of Pharmacy, Philadelphia College of Pharmacy, Maryland College of Pharmacy, and Cincinnati College of Pharmacy. After the election of new members, and the report of the Executive Committee had been received, the President delivered his Annual Report, one paragraph of which we subjoin, as it refers to a difficulty that not long since demanded attention in our own Society.

"In reflecting on that clause of the Constitution relative to life-membership, the question has arisen, How is the Association to be supported in the future so as to meet the natural increase of its expenses? The support of the Body is virtually thrown on a new set of members every ten years. Assuming that our present income is just sufficient to carry us on, we must necessarily ten years hence have just double our number. Where then is the margin for prizes, and other extraordinary outlays? Will it not be wiser to reduce the annual subscription to *one dollar* after ten years' membership, so that the sum will cover the cost of a copy of the Proceedings due to each member, and give a reserved pecuniary power for the future?"

From the Treasurer's report it appears that the Association is free from debt, and has a balance in hand. The papers in answer to the scientific queries agreed upon at the last meeting were called up, when it appeared that a considerable number had been replied to, and the respective papers were referred for publication. With reference to the Pharmacopœia, the following resolution was adopted:—

"*Resolved*, That a permanent Committee on the Pharmacopœia, to consist of three members, be appointed to keep a current commentary upon the Pharmacopœia, and a record of all useful criticisms and suggestions that may be made upon it while in practical use, with a direct view to its future revision; and that the Chairman of this Committee may, at his option, report an abstract of such information as he may gain at the annual meetings of the Association; and, finally, that members generally be requested to communicate to the Chairman any information or suggestions bearing upon the duties of the Committee."

The Committee appointed at a meeting in Philadelphia, in 1862, to report a series of questions for investigation, offered a list of twenty-nine subjects, which have been accepted by various members of the Association.

ON THE SOLUBILITY OF SOME METALLIC OXIDES IN SOLUTIONS OF THE ALKALINE CITRATES.

BY HARRY NAPIER DRAPER, F.C.S.

It is well known that citric and tartaric acids prevent, under some circumstances, the precipitation of metallic oxides, and this fact is indeed employed in ordinary analysis, as, for example, in the separation of peroxide of iron from the phosphates and oxalates of the alkaline earths. In many chemical works, too, the solubility of citrate of lead in so-

lution of citrate of ammonia is mentioned. I am not aware, however, that any direct experiments have hitherto been made with other metallic oxides, or that attention has been called to the pharmaceutical importance of the subject. I was first led to examine the action of the alkaline citrates on metallic oxides by a paper published in the 'American Medical Times,' by a Mr. Lalor. Mr. Lalor, having reason to suspect the presence of lead in a specimen of ammonio-citrate of iron, examined it, and found the metal to the enormous proportion of 25 per cent. Seeing that the explanation given in this case, namely, that the lead was derived "from the use of an impure sulphate of iron," was manifestly erroneous, the simple experiment of allowing a solution of ammonio-ferric citrate to remain for a few days in contact with some clippings of sheet lead, at once supported my own view of the matter, and showed that this dangerous impurity was in all probability due to the employment of leaden vessels in the preparation of the citrate. This result led to the further experiments, which I shall now, as briefly as possible, detail. I have not attempted to obtain precise quantitative results, but simply such data as may be useful to the practical pharmaceutical chemist. I may suggest that it would be desirable to ascertain what is the limit of solubility in the cases detailed; how this solubility is affected by differences of molecular condition; and whether the alkaline citrates form with the metallic oxides definite and crystalline double salts.

My own experiments have only been carried so far as to demonstrate the following facts:—

(*a.*) Solutions of the neutral citrates of ammonia, soda, and potash dissolve sensible quantities of metallic copper and lead and their dry oxides at ordinary temperatures.

(*b.*) The same solutions dissolve a comparatively large quantity of the moist hydrated oxides of iron, copper, lead, and bismuth, and solution is in these cases accelerated by heat, and its activity is dependent upon the quantity of alkaline citrate present, and upon the molecular state of the oxide, *e. g.* a recently-precipitated oxide is more easily soluble than an oxide which has been for some time prepared.

(*c.*) The ammonia and soda citrates have greater solvent power in relation to metallic oxides than the citrate of potash.

(*d.*) Solutions of the oxides of bismuth, lead, copper, and iron in the alkaline citrates are unaffected by many of the reagents, which either produce precipitates or marked change of colour in solutions of the same oxides in the mineral acids.

Solutions of the citrates of ammonia, potash, and soda were prepared, containing in each 1000 fluid grains 250 grains of citrate respectively. The moist metallic oxides were suspended in water in such proportion that 2000 grains of water contained a quantity equivalent to 33·3 grains of anhydrous oxide. To this 1000 fluid grains of the alkaline citrate solution were then added, and where solution did not immediately take place, heat was applied. The application of heat was found necessary in all cases, except those of the oxides of lead and copper in the soda and ammonia citrates. In the potash citrate it was found impossible to dissolve the entire of any of the oxides even after continued ebullition. With this exception, all the solutions contained in 300 fluid grains 33·3 grains of metallic oxide, and in the case of the potash citrate I should think that about one-half of each remained undissolved.

In the tabular statement given below the action of several ordinary reagents upon each solution is shown. The addition of a weak acid, as citric or acetic, was always sufficient to enable the characteristic reaction of iodide of potassium, or bichromate of potash upon lead salts to manifest itself:—

I.—*Peroxide of Iron.*

	Citrate of Ammonia.	Citrate of Soda.	Citrate of Potash.
Ammonia	No change.....................	As before	As before.
Carbonate of ammonia ...	,,	,,	,,
Potassa	Precpt. (Fe_2O_3)	,,	,,
Carbonate of potassa	No change.....................	,,	,,
Ferrocyanide of potassium	Dark-green coloration	,,	,,
Phosphate of soda	No change.....................	,,	,,
Sulphide of ammonium ...	Black precipitate	,,	,,
Gallic acid	Greenish-brown coloration	,,	,,

II.—*Protoxide of Copper.*

	Citrate of Ammonia.	Citrate of Soda.	Citrate of Potash.
Ammonia	Dark-blue colour	Dark-blue colour.	Dark-blue colour.
Carbonate of ammonia ...	„	„	„
Potassa	„	„	„
Carbonate of potassa	„	No change	No change.
Sulphide of ammonium ...	Brown precipitate............	Brown precipitate	Brown precipitate
Ferrocyanide of potassium	Reddish-brown precipitate	Reddish-brown ppt.	No change.

III.—*Protoxide of Lead.*

	Citrate of Ammonia.	Citrate of Soda.	Citrate of Potash.
Ammonia	No change.....................	As before	As before.
Carbonate of ammonia ...	„	„	„
Potassa	„	„	„
Carbonate of potassa	„	„	White precipitate.
Hydrochloric acid	Ppt. (PbCl)	„	„
Sulphuric acid	Ppt. (PbO,SO_3)	„	„
Citric acid	No change.....................	„	„
Iodide of potassium	„	„	„
Sulphide of ammonium ...	Ppt. (PbS)	„	„
Bichromate of potash	Yellow precipitate	„	„
Phosphate of soda	Milkiness	„	„

IV.—*Teroxide of Bismuth.*

	Citrate of Ammonia.	Citrate of Soda.	Citrate of Potash.
Nitric acid	No change........	As before	Precipitate: Redissolving.
Hydrochloric acid	„	„	Precipitate.
Sulphuric acid...............	„	„	Cloudiness.
Acetic acid	„	„	No change.
Citric acid	„	„	„
Ammonia	„	„	„
Carbonate of ammonia ...	„	„	„
Potassa	„	„	„
Carbonate of potassa	„	„	„
Bichromate of potash	„	„	„
Phosphate of soda	„	„	„
Iodide of potassium	„	„	„
Sulphide of ammonium ...	Ppt. (BiS_3)	„	Ppt. (BiS_3)

A knowledge of this solvent action of the alkaline citrates may be useful in two ways: firstly, as cautioning against the employment of metallic vessels in the preparation of the medicinal citrates; and secondly, inasmuch as it may lead to improved methods of

therapeutically administering metals which cannot now be given in the state of ordinary solution, owing to the facility with which they are decomposed.*—*Dublin Medical Press.*

REVIEWS.

The Quarterly Journal of Science. No. 1, January, 1864. London: Churchill and Sons. Pp. 212. Price 5*s.*

We gladly call the attention of our readers to this new quarterly journal, which, judging from the present number, promises to take a high position amongst our scientific periodical literature. It is under the editorship of James Samuelson and W. Crookes, F.R.S., and amongst its contributors we notice the names of many gentlemen of eminence in every department of science. It is stated that the 'Journal of Science' "will constitute a Review of the progress of science in all parts of the world, and is intended to serve as a medium of communication between students in various branches of Natural and Physical Science, as well as between scientific observers and the reading public."

The present number commences with an introductory statement of its objects, and a good summary of recent scientific discoveries, with suggestions upon, and subjects for, future investigations. This introduction is followed by original articles, on "The Coal Resources of Great Britain," by Mr. Hull, which indicates that our supplies will last longer than some writers have recently led us to believe; "Oceanic Telegraphy," by Dr. Wallich and Mr. Crookes; "The late Earthquake, and Earthquakes generally," by Mr. Mallet; "Lighthouse Illumination by Magneto-Electricity," by Dr. J. H. Gladstone; "The Conservation of Force applied to Physiology," by Dr. Carpenter; and "The Reputed Fossil Man of Neanderthal," by Professor William King. To these original articles follow chronicles of the present state and progress of agriculture, astronomy, botany, chemistry, geology, palæontology, microscopy, mining, mineralogy, metallurgy, photography, physics, sanatory science, and zoology. Reviews of recent scientific books, with some interesting and instructive notes and correspondence, complete the present part. The above notice of its contents will indicate how varied is the information that may be derived from its pages. The great object aimed at by all the writers has been to communicate strictly scientific matter in a readable form, in which we consider they have been eminently successful. From the great merits of this first part we augur well for the future success of the 'Journal of Science.'

The Medical Formulary: being a Collection of Prescriptions derived from the Writings and Practice of many of the most eminent Physicians in America and Europe, together with the usual Dietetic Preparations and Antidotes for Poisons. To which is added an Appendix on the Endemic Use of Medicines, and on the Use of Ether and Chloroform. The whole accompanied with a few brief Pharmaceutical and Medical Observations. By Benjamin Ellis, M.D., late Professor of Materia Medica and Pharmacy in the Philadelphia College of Pharmacy. 8vo. Eleventh edition, carefully revised and much extended, by Robert P. Thomas, M.D., Professor of Materia Medica in the Philadelphia College of Pharmacy. Philadelphia: Blanchard and Lea. London: Trübner and Co. 1864.

The mere fact of the appearance of the *eleventh edition* of this useful work is at once evidence of the greatest value in its favour, showing, as it does, that it has not only supplied a want, but has done so in a most satisfactory manner. The language of the Formulary in the present edition has been made to correspond with the nomenclature of the new United States Pharmacopœia. It contains a very large number of prescriptions, which include the most important articles of the Materia Medica in use in England and the United States, and arranged according to their actions and uses as internal remedies, under the respective heads of cathartics, emetics, tonics, narcotics, antispasmodics, alteratives, etc. etc. To these succeed a series of prescriptions adapted for external application,

* Some closely allied reaction appears to have been applied to the production of a solution of bismuth, which is miscible with water, and which is evidently only a solution of the oxide in the ammoniacal salt of some organic matter.

arranged under the heads of caustics, rubefacients, collyria, gargles, etc. We have, then, many useful formulas given for dietetic preparations and beverages for the sick, followed by a short notice of some of the more important poisons and their antidotes. The work is concluded by a concise and well-written article on the Use of Ether and Chloroform, by Dr. Morton. We should also state that we find a carefully-compiled table of the doses of the principal articles of the Materia Medica, and an extended and systematic index; altogether, the volume appears to have been very carefully edited, and brought down to the present state of science. We can safely recommend it as a reliable and very useful guide to practitioners of medicine, and to those whose especial business it is to dispense prescriptions.

MISCELLANEA.

Royal Horticultural Society.—We are informed that, having in view the encouragement of the study of scientific botany amongst all classes, the Royal Horticultural Society offer the following prizes:—1. One silver and two bronze medals for the three best collections of wild plants of each separate county of the United Kingdom, dried, mounted on paper, folio demy size, classified according to the natural system, and labelled with the name and locality where found, and the date when found. Intending competitors may obtain the forms of labels on sending twelve postage stamps to the Secretary of the Royal Horticultural Society, South Kensington. 2. Three gold medals will be given for the three best of all the collections out of all the several county collections. Not more than one of the medals can be awarded in one county. The collections must be delivered on or before the 31st December, 1864, to the Secretary of the Royal Horticultural Society, South Kensington, carriage free, marked with a number or cypher, and accompanied with a sealed letter containing the collector's name, the address, and the price at which the collection can be sold or another made. A Society's gold medal will also be awarded to every exhibitor of a new species of plant found growing in the United Kingdom.—*Daily News.*

Poisoning by Arsenic.—Miss Amelia Huband, a young lady who was staying with the Rev. J. E. Vernon, curate of Himbleton, near Droitwich, and who was niece of his wife, died in October last after a short illness. She was buried on the certificate of Mr. Bishop, surgeon, of Worcester, that the cause of death was bilious cholera and syncope. Rumours, however, got abroad that she had come by her death unfairly, and these coming to the ears of the coroner, Mr. Hughes, the body was ordered to be exhumed. A *post-mortem* examination then disclosed the fact that the deceased was five or six months pregnant, and the state of the stomach was such that it was sent to a chemist for analysis, the inquest being deferred until Friday, Nov. 27. The first witness called was Miss Trotman, who had seen the deceased shortly before her death. Miss Huband had complained of violent headache on the 6th, and at night made some gruel. Next morning witness was informed that she had been ill all night and had vomited, and about 9 o'clock on the morning of the 7th she died. Mr. Budd, surgeon, of Worcester, received the stomach and intestines of the deceased from Mr. Bishop, surgeon, who had made the *post-mortem* examination; and he, with the assistance of Mr. Perrins, chemist, of Worcester, had analysed the contents, and found abundant proof of the presence of arsenic.

Being questioned as to the circumstances attending the death and interment of the deceased, Mr. Bishop stated that he had been requested by Miss Huband's brother to attend his sister. He was unable to go at the time, but from the description of the symptoms he concluded that the deceased had a bilious attack, and he prescribed accordingly. He went to see the patient in the evening, when he found that she had died soon after the messenger had been dispatched in the morning. He certified that she had died of bilious diarrhœa and syncope; but, until he had made a *post-mortem* examination, he had no idea that death had been the result of unfair means. It was stated in evidence that a man named Cole had been in the habit of visiting Miss Huband secretly, and it appeared that he was aware of her condition, and had proposed marriage. A large packet of arsenic, of which Mrs. Vernon had no knowledge, was found by the police in a cupboard of the house. The jury returned the following verdict:—"That deceased was several months pregnant, and died from the effects of arsenic; but whether taken by herself, or given to her by any other person, there was no evidence to show."

Accidental Poisoning.—On Monday, Dec. 28, several men in the employ of Messrs. Leberier, dyers, Mile-End, drank beer from a can which had previously contained a mixture called "Springfield's Patent," which appears to be a solution of arsenic. They were all seized with symptoms of poisoning, and one of them, John Herring, died in consequence. The jury returned a verdict to the effect that death was caused by accident.

Another case occurred at Oswestry, in which a man named Wilson was supplied by a druggist with several packets of saltpetre in mistake for Epsom salts. One of these was taken dissolved in water, and was followed almost immediately with vomiting and pain. A surgeon was sent for, but the man died in a few minutes after his arrival. The quantity in each of the packets is not mentioned. Verdict, "Accidentally poisoned."

A third case is a repetition of that which has been so lamentably frequent,—*laudanum in mistake for tincture of rhubarb.* It appeared that Mrs. Farr, of Wigan, sent to Mr. Kellett, druggist, for three-pennyworth of tincture of rhubarb, half-a-teaspoonful of which she gave to her infant, and as unusual symptoms were observed, a surgeon was sent for, when it was discovered that the phial contained laudanum. Of course, the child died in a few hours. Mr. Kellett did not deny having served it, but could not account for the mistake. The verdict of the jury was to the effect "That death had resulted from a dose of laudanum given in mistake; and Mr. Kellett was exonerated from criminal liability;" but the foreman desired to say, in the name of the jury, that in their opinion bottles containing poisonous drugs ought, under no circumstances, to be near those containing medicines in hourly requisition. They thought, too, that labels ought to be in English, and plainly printed, so that mistakes should be less liable to occur.

Alleged Poisoning by Aconite.—An inquest has been held before Mr. Humphreys, coroner, on the body of Mrs. Elizabeth Morris, aged 34, who, it was suspected, had died from the effects of aconite. It seems that the deceased did not live very happily with her husband, and on Thursday, Nov. 19th, he had given her what he called "head and stomach pills." Shortly afterwards she became very ill and was seized with convulsions, and died at four o'clock the following morning. A *post-mortem* examination was made, and the contents of the stomach sent to Dr. Letheby, who however failed to detect any poison, but it was proved that death did not result from natural causes. The jury, after some deliberation, returned the following verdict:—"That the deceased, Eliza Morris, died suddenly at 34, Grey Eagle Street, Spitalfields, on the 20th of November; and the jurors do further say that her said death did not arise from natural causes."

Fire Caused by Ignition of Phosphorus.—A fire which at one time threatened very disastrous results occurred on the 14th of January, on the premises of Messrs. Wm. Huskisson and Sons, of Swinton Street, Gray's Inn Road, arising from the accidental fall of a tin of phosphorus. The concussion caused by the fall occasioned the ignition of the phosphorus; and as the accident happened within a very short distance of a large store of sweet spirit of nitre, much alarm was occasioned. The fire, however, was subdued before any great amount of damage was done to the stock, although, from the burning of so large a quantity of phosphorus, great volumes of the dense fumes of phosphoric acid filled and surrounded the premises, to the astonishment of the assembled crowd.

We are sorry to record the death of Mr. Thomas Cutting, of Selby, who died on the 19th ultimo. Mr. Cutting was a staunch supporter of the Society, and rendered an essential service in the passing of the Juries Bill.

BOOKS RECEIVED.

The Dental Review; a Quarterly Journal of Dental Science. January, 1864. New Series, No. I., Vol. I. London: Robert Hardwicke, 192, Piccadilly. Edinburgh: Maclachlan and Stewart. Dublin: Fannin and Co. Philadelphia: Lindsay and Blakeston.

The Second Step in Chemistry; or, the Student's Guide to the Higher Branches of the Science. By Robert Galloway, F.C.S., etc. With Illustrations on Wood. London: John Churchill and Sons. 8vo, pp. 774. 1864. (*From the Publishers.*)

The Medical Mirror; a Monthly Magazine of Current Medical Literature and News. Vol. I., No. I. 1864. London: H. K. Lewis, Gower Street North. Edinburgh: Maclachlan and Stewart. Dublin: Fannin and Co. (*From the Editor.*)

THE HALF-YEARLY ABSTRACT OF THE MEDICAL SCIENCES, July–December. 1863. London: John Churchill and Sons. Edinburgh: Maclachlan and Co. Dublin: Fannin and Co. 1864.

A MANUAL OF PHOTOGRAPHIC CHEMISTRY, THEORETICAL AND PRACTICAL. By T. FREDERICK HARDWICH. Seventh Edition. Edited by George Dawson, M.A., etc., and Edward Hadow, F.C.S., etc. London: John Churchill and Sons, New Burlington Street. 8vo, pp. 594. 1864.

THE QUARTERLY JOURNAL OF SCIENCE, No. I. January, 1864. London: John Churchill and Sons. Paris: Victor Masson. Leipsic: Ludwig Denicke. (*From the Publishers.*)

TO CORRESPONDENTS.

We beg to direct attention to the fact that two important Acts of Parliament came into operation on the 1st of January,—the first, that regulating the condensation of hydrochloric acid gas in alkali works; and the second, that relating to fraudulent trade-marks.

W. W. (Wimborne).—(1.) *Chloric Ether.* A solution of chloroform in spirit. The degree of miscibility with water depends on the proportion of chloroform it contains. (2.) *Magnesiæ Carbonas ponderosa.* (3.) *Tannate of Quinine.* See Vol. I. (1st Series,) p. 556. (4.) The simple tincture is intended.

"*Muscovado.*"—*Grape Sugar* may be obtained of any operative chemist, but it is easily prepared from honey, by washing the latter with cold alcohol, which dissolves the syrup, leaving the glucose.

W. J. F. (Birkenhead.)—*Plasma.* See Vol. XVII. p. 400.

"*An Associate*" (London).—*Syrupus Ferri Superphosphatis.* Vol. I. (2nd Series), p. 497.

"*A London Member.*"—The cost of the licence for the use of a still is 10*s.* per annum.

Chemist (Newcastle).—The 'British Pharmacopœia' may now be obtained through any bookseller, price 10*s.* 6*d.* The smaller copy, at 6*s.*, will, we are informed, be also ready early in February.

R. A. (Sheffield).—Fownes's 'Manual of Chemistry,' and Bentley's 'Manual of Botany.'

M. P. S. (London).—A new edition of Pereira's 'Materia Medica' is in a forward state of preparation.

"*Crinis*" (Leeds) wishes for a formula for "Batchelor's Hair Dye."

"*Quercus.*"—The change alluded to is due to the oxidizing agency of the Solution of Chlorinated Soda on the Tannin.

J. M. (North Devon).—Messrs. Smith and Beck, Cornhill. The price would vary from 5 to 10 guineas.

Minor.—The Board of Examiners will not examine on the new preparations introduced into the 'British Pharmacopœia' until it has been a reasonable time before the public.

"*Beta*" (Stafford).—*Quinine Wine.* See Pharm. Journ. Vol. VI. p. 226. A good result depends much on the use of a sound wine.

A Defaulter.—1. Persons having seceded from the Society may be restored to their former status on payment of arrears of subscription, and the registration fee for the current year. 2. Those who were Associates of the Society before the 1st July, 1842, are privileged to become members (as founders of the Society) without examination. 3. Apply to the Secretary and Registrar, 17, Bloomsbury Square, W.C.

ERRATUM.—Page 331, line 13, *for* "stretch" *read* "sketch."

Instructions from Members and Associates respecting the transmission of the Journal before the 25th of the month, to ELIAS BREMRIDGE, Secretary, 17, Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Messrs. CHURCHILL, New Burlington Street. Other communications to the Editors, 17, Bloomsbury Square.

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. V.—No. IX.—MARCH 1st, 1864.

THE PROPOSED LEGISLATION AFFECTING PHARMACY.

Many of our readers have undoubtedly observed the agitation around them on this subject; it is not simply in the journals devoted to pharmacy that the question has been discussed, nor even that what may fairly be called the *higher* medical journals have taken it up, but it is now considered of sufficient public interest to be introduced into the ordinary newspapers; some of them expressing opinions which, in our judgment, appear most just and reasonable. And if others differ from us, and assign to pharmacy a less important place than it deserves, we must still regard the whole as working for our benefit. It is full and free ventilation which in nine cases out of ten places a disputed point in its proper light, or brings a neglected one before the minds of men who are interested in its final adjustment.

Twenty years or more ago, the founders of the Pharmaceutical Society said, "*the dispensing of medicines, involving as it does the life and health of the public, should be confined to those who possess a competent knowledge of the nature and properties of drugs;*" ten years later the same men made earnest efforts to obtain a legislative enactment so to confine it, and were only defeated by a certain free-trade principle, which rebelled at the idea of restricting the sale of anything. Unfortunately the traffic in medicine, unlike that in tea, brandy, and spices, was not one from which the Board of Inland Revenue could extract a toll, and so only a voluntary qualification was established. But even this concession confirmed the views of our predecessors, and the seed then cast into the earth now brings forth what seems to be a vigorous plant. On all hands it is acknowledged now that the dispensers of medicines should possess "*competent knowledge.*" We say on all hands, but there is one melancholy and unfortunate dissentient, one whom least of all we should have expected to find in opposition—our worthy contemporary the 'Medical Times,' which states in an article of February 13th, "*that any intelligent, neat-handed lad, or woman of ordinary education, can be taught to dispense accurately and well in three months*"*!*

A journal is supposed to express the opinions of the class for whom, and generally by whom, it is written; but knowing what we do of the physicians and surgeons of England, we fearlessly deny that this opinion is held by them. If indeed it were a question of mere manipulation, we could not dispute that in three months the mechanical operations of weighing, measuring, and, *to some extent*, compounding, might be acquired; but will our friend utterly ignore the higher qualification necessary for one to whom is entrusted the preparation of medicine? Is no knowledge of the power of the articles to be weighed, measured, and compounded, necessary? A case strikes us at once. A month ago a

physician prescribed for his patient three grains of chloride of mercury, which, both by law and custom, signified calomel, and was a proper dose. To-day, habituated to the custom, and forgetful of the new law, he writes a similar prescription. What is the result? The mechanical dispenser strictly performs his duty, accurately weighs three grains of "chloride of mercury," and kills the patient with that which is by the British Pharmacopœia corrosive sublimate. Is there no intelligence wanted, then, higher than that required for adjusting the mainspring of a watch or the lens of a microscope? Is our contemporary entirely ignorant of the fact that physicians, like other men, are liable to error, and that their errors would frequently occasion serious results, were it not for the supervising care of the dispensers into whose hands their prescriptions fall? We know too well the thankfulness of prescribers when reference is made to them in such cases, to believe that they would be satisfied with uneducated chemists. And if further proof were wanted, is it not found in the greater amount of patronage given by physicians to those establishments in which it is known that qualified dispensers are employed? What can have so perverted the judgment of the writer? Is it that, "*if the amount of knowledge required by a Pharmaceutical Chemist is such as to make it incumbent on the State to examine him, his business is at once elevated from a trade into a profession, and the line of demarcation between him and the practitioner of medicine who keeps an open surgery is rendered proportionately more inappreciable in the eyes of the public?*" We would not accuse him of such petty jealousy. He may rest assured that it is not the educated pharmaceutical chemist who trespasses on the ground of the doctor. Chemists are indignant at his estimate of the qualification necessary for them; and we refer with much pleasure to a letter in our correspondence of this month, from Mr. J. Ruddock, who, although not a member of our Society, has addressed us on the subject.*

Since the Pharmacy Act passed in 1852 many circumstances have occurred, trivial perhaps if regarded singly but important in the aggregate, to justify such an extension of it as its first promoters, with their intimate knowledge of the subject, deemed desirable even then. The recognition given by the State in questions of public employment, and certain privileges accorded to them, have served to encourage pharmaceutical chemists; while the discussions arising from time to time on attempted Poison Bills have brought them prominently into notice, and led men best capable of judging, to the conclusion that, as an experiment, that Act has been successful. The facility afforded to the higher branches of the medical profession in obtaining information and assistance on matters of pharmacy from our Society has convinced them of its usefulness and satisfied them as to its character; and it is indeed the proposition of a Committee of the Medical Council which has, like the last feather on the camel's back, brought things to a crisis, and caused this general outburst. We have reason to believe that the Medical Council has really no desire to come into the realm of pharmacy, but seeing the absolute necessity of a compulsory examination for dispensers, and no Board armed with power to enforce it, the Committee stepped forward honestly to supply a deficiency.

The question then arises whether, if chemists will on their own part earnestly set to work to perform for themselves, rather than let others perform for them, this acknowledged necessary work, the Medical Council would not gladly aid them in procuring the power to do it? And this question now comes before us in a tangible shape. Our readers will observe in our present number of the Journal a memorial which has been presented to the Council, urging the propriety of calling a general meeting of the Society to consider "*the expediency of an immediate application to Parliament for an amended Pharmacy Act,*

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* This letter is unavoidably postponed, for want of space.—Ed. Ph. Jour.

by which (following the precedent of the 'Apothecaries' Act') the legitimate interests of those already in business should be protected, and proper provisions made for rendering the examinations of future chemists compulsory instead of optional." This requisition bears the signatures of about three hundred of the most respectable and influential members of our Society, and is framed in so honest and liberal a spirit that it deserves and will, we hope, obtain very careful consideration.

THE CENSUS RETURNS RELATING TO PHARMACY.

In the discussion of questions affecting the interests of the body of chemists and druggists in this country, it has frequently been asked, how many individuals are there belonging to this class who are engaged in business on their own account? Statements have been made at different times representing the numbers, in some instances as low as six or eight thousand, and in others as high as forty thousand. It may be recollected that when the Juries Act was under discussion in the House of Commons, the claim made on behalf of the body of chemists and druggists to be exempted from serving on juries, was opposed by members of the Government on the ground that the country could not afford to dispense with the services of some forty thousand intelligent men of business, the chemists having been estimated at this number by those who represented their interests.

The members of the Pharmaceutical Society were a recognized, educated, and smaller number, and to them the privilege asked for was granted. On subsequent occasions it has frequently been represented, by persons pretending to be well informed upon the subject, that the Pharmaceutical Society contains but a small proportion of those who are engaged in the practice of pharmacy throughout the country. The last estimate of the total number of chemists and druggists that we have seen, put them at thirty thousand, while the members of the Pharmaceutical Society do not much exceed two thousand. But it may be asked, what authority is there for these statements? Are there no authorized returns that will supply reliable information upon a point of so much importance in the discussion of questions now pending? It may be answered that the census returns afford us the information required, in a perfectly reliable form. These returns are before us, and we propose to give such extracts as will place the question definitively at rest.

The population of England and Wales, as taken by the census of 1861, was 20,228,497, while the number as taken at the previous census, in 1851, was 18,054,170; the increase during the ten years from 1851 to 1861 having been at the rate of 12 per cent., or 1·141 per cent. annually.

The present population of England and Wales may then be given in round numbers at twenty millions, and to minister to the medical wants of this population it appears that there are 38,441 persons engaged, or preparing to engage, in different departments of the practice of medicine. Thus the Registrar General in his report states—

"The medical sub-order comprises 38,441 persons, of whom 35,995 are men and 2446 are women; 14,415 physicians, surgeons, and apothecaries, are at the head of the list; 3566 medical assistants and students, 1567 dentists, and 16,026 chemists and druggists, including apprentices and assistants (3388 of the age 10–20), follow. Then there are of men cuppers 10, officers of medical societies and agents 21, corn-cutters 56, professors of hydropathy and homœopathy 27, herb doctors and patent medicine vendors 92, 82 medical botanists, 50 galvanists, 12 mesmerists, 21 bone-setters, 22 quack doctors, so returned, and 2 cancer doctors, besides others. The women consist chiefly of druggists, 388, and midwives 1913."

It thus appears that in England and Wales, with a population of twenty millions, there are sixteen thousand chemists and druggists of all sorts, including apprentices and assistants. The returns do not indicate what proportion of these are engaged in business on their own account, but they classify them according to their ages, and we thus find that of the 16,000 there are only 12,638 of the ages of 20 years and upwards. There are therefore 3388 who are under 20 years of age, and who no doubt constitute the class of apprentices. Of the 12,638 persons of 20 years of age and upwards who are engaged in the practice of pharmacy, a large proportion occupy the position of assistants. Although the census returns afford us no means of showing exactly how many are principals and how many assistants, yet we may form a pretty good estimate of this by referring to the statistics of such a place as London. Mr. Coke, one of the compilers of the "statistical charts of the population," in his very useful and compendious tables, has calculated the average number of the population in London to every chemist and druggist, and this shows that there is one chemist and druggist to 3505 of the population. If the same proportions exist throughout the country, we should thus get 5700 as the number of chemists and druggists for England and Wales. We may put them at 6000, and then we should have equal numbers of principals and assistants or apprentices, of 20 years of age and upwards.

Referring back to the census returns of 1851, we find that the total number of chemists and druggists, including apprentices and assistants, was then 14,039, of whom 3193 were under 20 years of age, leaving 10,846 of and above that age. The increase in the number of chemists in the 10 years from 1851 to 1861, taking those of 20 years of age and upwards, has been at the rate of 17 per cent., while the increase in the population has been at the rate of only 12 per cent. This is worthy of remark, especially as it appears that little or no increase has taken place in the class of medical practitioners. According to the returns, physicians, surgeons, and other medical men, including students and assistants, were 19,190 in 1851, and they were only 19,548 in 1861.

We shall probably have to refer to these statistics on a future occasion.

TRANSACTIONS

OF

THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *February 3rd*, 1864,

Present:—Messrs. Bird, Davenport, Deane, George Edwards, J. B. Edwards, Hanbury, Haselden, Herring, Hills, Meggeson, Morson, Reynolds, Sandford, Savage, Squire, and Waugh,—

The following were elected

MEMBERS.

Eastbourne..............................Clayton, Henry.
Esher ....Ling, Edwin.
Florence ....Groves, Henry.
London ....Bass, James.
Portobello ....Nesbit, John.
Rio de Janeiro ....Ferreira, Antonio Alves.
Selby ....Cutting, Thomas John.

The following, having paid their arrears and their subscriptions for the current year, were restored to Membership:—

Maidenhead	Walker, Robert.
Margate	Quested, George

ELECTION OF COUNCIL.

The lot having been taken for the Council, the following Members were declared to remain in office for the ensuing year:—

Edwards, George	Dartford.
Edwards, John Baker	Liverpool.
Haselden, Adolphus Frederick	18, Conduit Street.
Hills, Thomas Hyde	338, Oxford Street.
Proctor, Barnard S.	11, Grey Street, Newcastle.
Reynolds, Richard	13, Briggate, Leeds.
Sandford, George Webb	47, Piccadilly.

The following are the Members who go out of office, but are eligible for re-election:—

Bird, William Lionel	42, Castle Street East, Oxford Street.
Davenport, John T.	33, Great Russell Street.
Deane, Henry	Clapham.
Evans, Henry Sugden	52, Hanover Street, Liverpool.
Hanbury, Daniel Bell	Plough Court, Lombard Street.
Herring, Thomas	40, Aldersgate Street.
Horner, Edward	20, Bucklersbury.
Mackay, John	119, George Street, Edinburgh.
Meggeson, George	Wandsworth.
Morson, Thomas N. R.	38, Queen Square, Bloomsbury.
Savage, William Dawson	65, Edward Street, Brighton.
Squire, Peter	277, Oxford Street.
Standring, Thomas	1, Piccadilly, Manchester.
Waugh, George	177, Regent Street.

On the recommendation of the Library Committee, it was

Resolved—"That the periodicals be circulated at the end of a month from the date of their receipt."

BENEVOLENT FUND.

The following subscriptions to the Benevolent Fund, received during the month of January, were announced:—

	£	s.	d.
Buckle, Christopher F., 77, Gray's Inn Road	£0	5	0
Brown, Edward, Leeds	0	10	6
Bagshaw, William, Oldham	1	1	0
Bird, Augustus, 22, High Street, Kensington	1	1	0
Blake, Sandford, and Blake, 47, Piccadilly	1	1	0
Eddy, Charles W., 30, Crown Street, Finsbury	1	1	0
Goodger, David, 31, Regent St.	0	10	6
Groves, Thos. B., Weymouth	0	10	6
Hurst, Wm. J. H., Gloucester	0	5	0
Hooper, Bartlett, 43, King William Street, City	0	10	6
Hickley, Thos. P., 125, Edgeware Road	£0	10	6
Jones, Henry S., 139, Fulham Road	0	5	0
Kernot, George Charles, Poplar	0	10	6
Mould, Samuel, 21, Moorgate St.	0	10	0
Pollock, Thos., 129, Fenchurch Street	1	1	0
Parsons, Wm., Portsmouth	0	10	0
Rastrick, Joseph L., Southsea	0	5	0
Shirley, John Geo., Bayswater	0	10	6
Starkie, Richd. S., 4, Strand	1	1	0
Windle, Wm., 48, Portman Place	0	10	6
White, Daniel, 19, Park Terrace Regent's Park	1	1	0

ERRATA.—Page 305, *for* "Haselden and Fisher" *read* "Fisher and Haselden"
,, 341, *for* "Thomas Walls White" *read* "James Walls White."

DONATIONS.

Ferreira, Antonio Alves, Rio de Janeiro............	£1	1	0
Kerr, Abiah	1	1	0

The sum of ten pounds, as temporary assistance, was granted to the family of a distressed Member of the Society.

SPECIAL MEETING OF THE COUNCIL, *February 26th*, 1864.

Present:—Messrs. Bird, Davenport, Hanbury, Haselden, Herring, Hills, Meggeson, Morson, and Sandford.

The following requisition, duly signed, was submitted to the Council:—

"*To the President, Vice-President, and Council of the Pharmaceutical Society of Great Britain.*

"Gentlemen,—We, the undersigned, believing that it is highly desirable for the protection of the public that all future Chemists and Druggists should undergo a due professional examination before commencing business, hereby request you to convene a General Meeting of the Members of our Society, for the purpose of considering the expediency of an immediate application to Parliament for an amended Pharmacy Act, by which (following the precedent of the Apothecaries' Act) *the legitimate interests of those already in business should be protected*, and proper provisions made for rendering the examinations of future chemists by your Board a compulsory instead of an optional proceeding."

In compliance with the above requisition, it was

Resolved—"That a Special General Meeting of the Members of the Society be held on Thursday, the 17th March, at twelve o'clock *precisely*, and that the notice convening the said Meeting, with the names of the requisitionists, be announced in the ensuing number of the Journal."

A memorial from Leeds, signed by forty-five members and non-members of the Society, was also presented to the Council.

PHARMACEUTICAL MEETING,

February 3rd, 1864;

MR. G. W. SANDFORD, PRESIDENT, IN THE CHAIR.

The following

DONATIONS TO THE LIBRARY AND MUSEUM

were announced, and the thanks of the meeting given to the donors thereof:—

The Chemical News.
The Chemist and Druggist.
The Dental Review.
The British Journal of Dental Science.
The Photographic Journal.
The Educational Times.
The Technologist.
The Veterinarian.
The Medical Circular.
The Journal of the Society of Arts.
The Journal of the Chemical Society.
The Social Science Review.
Répertoire de Chimie.
Bulletin de la Société de Chimie de Paris.
Bulletin de la Société Botanique de France.
Répertoire de Pharmacie.
Kaiserliche Akademie der Wissenschaften in Wien; die Proceduren. No. 1–2. 1864.
From the respective Editors.

An Address on the Pneumoclime and the Pneumothalp Remedial Agents. By Julius Jeffreys, F.R.S. From the Author.

A List of the Fellows, Members, and Licentiates of the Royal College of Physicians. From the College.

Watts's Dictionary of Chemistry. Part xii. From the Author.

Papers on Indian Materia Medica. By E. Waring, M.R.C.S. From the Author.

The PRESIDENT, in opening the meeting, said he had much pleasure in placing before them a copy of the British Pharmacopœia, and in announcing a short course of evening lectures upon the subject of the Pharmacopœia, which would be delivered in this and succeeding months, by Professors Redwood and Bentley, and Dr. Attfield. They all had to bear in mind the fact that the British Pharmacopœia was now the authorized text-book by which they must be guided. There were many changes effected by the introduction of the new work, and they had all to make themselves acquainted with the nature of these changes. There were always inconveniences attending such alterations, but these were unavoidable, and it was the duty of all parties to facilitate the change from one system to the other as much as possible. In the first instance, it was often difficult to determine whether prescribers intended to order the new preparations or the old, and much discretion had to be exercised upon this point. Subjects connected with the changes effected by the new Pharmacopœia would no doubt be frequently brought before their evening meetings for discussion. He had now, however, to introduce a subject of a very different description, and he begged to call upon Mr. Tomlinson to read a paper.

ON THE VERIFICATION OF CASTOR OIL AND BALSAM OF COPAIBA BY MEANS OF THEIR COHESION FIGURES.

BY CHARLES TOMLINSON,

Lecturer on Physical Science, King's College School, London.

Every one in this place must be aware of the mode of preparation, and the properties of castor oil. The seeds of *Ricinus communis* are boiled and pressed, or simply pressed without boiling, forming, in the latter case, what is called *cold-drawn* castor oil. During many years the supply of the oil to this country was almost entirely from the East Indies* (from Bombay and Calcutta). The price was low and the oil good, both as to colour and taste. I have on the table a very fine specimen from the India Museum, furnished to me through the kindness of Dr. Forbes Watson. Small quantities of castor oil have been sent to this country from New York, the West Indies, and Australia, and some houses in this country have imported the seeds from the East Indies, and have drawn their own oil by pressure.

We still procure large quantities of the oil from the East Indies, but that country has now a rival, threatening to become formidable, much nearer home. In the International Exhibition Italy had a great show of castor oils. One firm at Legano is said to produce 45 tons of oil every year, the produce of about 120 tons of seed. At this establishment, presided over by M. Valeri, the machinery for cleaning and sorting the seeds, the hydraulic presses, and the filtering apparatus, are said to be well arranged. The oil cake is in great demand as a manure for hemp. The oil is also used for burning, and in some places for making soap, this oil saponifying more easily than olive oil.

* The castor-oil plant is cultivated all over India for domestic use, chiefly for burning. The oil is extracted by bruising the seed, boiling in water, and skimming.

The cultivation of castor oil is said to be increasing in France; the yield is very great, a single plant from one seed producing upwards of 800 or 900 seeds. The seeds sometimes yield more than half their weight of oil. The French and Italian oils are weaker than those from the tropics. Italian oil, prepared in Italy, of which there are some samples on the table, is a good bland oil. There are also other specimens, prepared in this country from decorticated Italian seeds.

The oil, as you know, is very viscid, the colour is yellowish, the taste, or rather *after-taste*, somewhat acrid, varying however with the freshness of the oil, and the mode of preparation. It retains its fluid, viscid character probably as low as 0° F. It differs from other fixed oils in being soluble in alcohol, a property which was long regarded as a test, until Pereira pointed out the fact that castor oil enables other fixed oils to dissolve in alcohol to the extent of 30 per cent. and upwards, so that a specimen may be mixed with olive, lard, nut, and other oils, and yet be soluble in alcohol. For example, *one* volume of olive oil, *two* volumes of castor oil, and *two* of rectified spirit, shaken together and gently heated, will form a transparent homogeneous solution. Benzoic acid and camphor also increase the solubility of castor oil in spirits containing 75 per cent. of alcohol (sp. gr. 0·860). What is called *concentrated castor oil* is common castor oil mixed with a small proportion of croton oil, which also enables other fixed oils to dissolve in alcohol to the extent of from 30 to 50 per cent.

It is superfluous to remark in this place that the distinction between chemistry and physics is not recognized by nature. Hence a lecturer on physics may address chemists without being accused of temerity, and there are numerous precedents for substituting a physical test for a chemical one, where the latter is defective, or not sufficiently expeditious for ordinary purposes. Such is the test that I venture to propose to-night, and I apply it to castor oil and balsam of copaiba, not because it is peculiarly adapted to those substances, but because they are so well known and so largely used in medical practice. My test is of a far more general kind. It is applicable to every independent liquid, by which I mean, not a solution, although it is possible that hereafter solutions may be examined by its means. The test, as I now submit it to your critical judgment, depends on the forces of cohesion, adhesion, and diffusion. For example, if I gently deposit a drop of an oil hanging from the end of a glass rod, upon the surface of chemically clean water, contained in a chemically clean glass, a contest takes place between the forces in question the moment the drop flattens down by its gravity upon the surface of the water. The adhesion of the liquid surface tends to spread out the drop into a film, the cohesive force of the particles of the drop strives to prevent that extension, and the resultant of these two forces is a figure which I believe to be definite for every independent liquid.* The figure thus produced I name the *cohesion figure* of the liquid in question. Doubtless if there be two or more liquids in nature of different chemical composition, but precisely alike in their physical characters, such as their density and molecular attraction, and relations to heat, whereby at a given temperature they are equally fluid, or limpid, or viscid, then doubtless the cohesion figures of those two liquids would be identical. I have succeeded in converting the cohe-

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* Strictly, the figure is a function of adhesion, cohesion, and diffusion: or—

$$F = f(CA\delta)$$

in which F is the figure, C the cohesive, A the adhesive, and δ the diffusive forces. The formula may also be represented in other ways. For if S be the solubility, d the density, and a the molecular attraction, then—

$$F = f(S\delta)$$
$$\text{or } F = f(Sda)$$
$$\text{or } F = f(CAda)$$

all these being identical.

sion figure of one essential oil into that of another by dissolving camphor in one of them, but in such case other characters were introduced which disturbed the comparison.

As the cohesion figure of a liquid depends so much on the adhesion of the surface, it is quite necessary that that surface be chemically clean. The water need not be distilled. I have found the New River Company's water well adapted to the purpose, but the vessel must be specially prepared. All vessels exposed to the air contract an organic film from their condensing on their surfaces the breath of animals, etc., and also other impurities from the products of combustion, dust, etc. If we attempt to clean the glass with a duster, however well we may satisfy the eye, we do not remove this organic film, or if we remove one, we substitute another from the cloth held in the hands; so that when the glass is filled with water, the film in question is detached, and spread over the liquid surface, effectually preventing adhesion. The plan I recommend is to appropriate certain glasses, about four inches in diameter at the mouth, to the purpose; to wash them out occasionally with commercial sulphuric acid, to rinse with water, and after every experiment to wash out the glass with a solution of caustic potash, and to rinse with water before filling up again. The water used for the experiment must be allowed to come to rest before the drop is deposited. The glass rods kept for the purpose should be of the same size, and these may for convenience be kept in the caustic potash vessel. When one is taken out, it should be shaken in water and wiped dry on a clean cloth. On dipping it into the oil, etc., it may be stirred round to mix the layers, if any, and then allowed to drain until the drops fall slowly; and the eye must determine when the rod is to be carried over the water, so as to deposit one, and only one drop, neatly and gently without any disturbance. In this, as in all other matters, doubtless each operator will have his personal equation, so that one man's result may not be precisely the same as that of another; but if the foregoing directions be attended to, sufficiently good cohesion-figures will be produced. Gentlemen have come to me, and have complained of their inability to get consistent figures; but on inquiry I have found their glasses not clean, or the mode of depositing the drop unsteady. In one case I saw a gentleman drop the liquid from a height of *ten* or *twelve* inches. I may also remark that in the case of fixed oils, it is of no use placing a second drop after the first one has failed, for in such case, the second drop either simply flattens, or in the case of some essential oils presents a beautiful example of the spheroidal condition of liquids at ordinary temperatures.

With some other volatile oils a second drop will displace the film formed by the first and produce a second cohesion figure on the same surface. With respect to the ethers, alcohol, etc., it is different: each drop forms a sharp and well-defined figure, lasting only about a second, and hence the best way of exhibiting such figures is to have the liquid in a dropping-tube, and allow drops to fall in regular succession on the surface of the water, by which means a regular succession of figures may be kept up and their characters studied. Here is some of Mr. Morson's creosote. A drop placed on the surface of two ounces of water forms a highly characteristic figure, sailing about with a vibratory, crispating edge. In the course of seven minutes this drop becomes gradually disposed of by solution; or in other words, the adhesion of the water completely overcomes the cohesion of the liquid, and diffusion spreads it through the mass of the liquid. A second drop may now be placed on the same surface. It exhibits the character of the first figure in a mitigated form; it is less active; it is disposed of by solution in $12\frac{1}{2}$ minutes; a third drop is disposed of in 25 minutes; a fourth drop ceases to give a cohesion figure at all: it is not disposed of after 110 minutes. In fact, the two ounces of water are saturated: that is, the adhesive force of the water and the diffusibility of the creosote are destroyed. Increase the quantity of water, and we restore the adhesive force and diffusibility

in proportion to the quantity, and the struggle between the water and the creosote sets in again with the characteristic figure. Here is a specimen of carbolic acid. The figure is very different from that of creosote, and its duration is very much less. And here it may be noted that some of the figures of oils, etc., are very durable, remaining on the surface for hours; and even among volatile oils the characteristic portions of some of them remain for a long time.

The strong adhesion between water and an oil may be shown by taking a slice of one of the seeds of the castor-oil plant and throwing it on the surface of clean water, when it will rotate feebly, after the manner of camphor on the surface of water, in consequence of the oil which diffuses from it over the surface in one direction producing rotation by reaction in another direction; but after a few turns the oil becomes equally diffused all round, and the motion ceases. Castor-oil seeds are heavy, they partly sink in cold water, and slices sink rapidly in hot.

The oil that escapes from the seed upon the surface of water does not form its cohesion figure. To get this we must allow a single drop to descend gently near to the surface of clean water, and the result will be a figure of extraordinary beauty. The drop will flatten into a disk, from which there will proceed a number of perfect iridescent rings, showing most of the colours in Newton's seven series; but beyond, and bounding these rainbows is a broad silvery corona of exquisite delicacy, which almost immediately breaks up into a charming lace-like pattern, which I have feebly attempted to represent on the diagram before you. These effects last some seconds, but gradually the colour disappears, the lace-like pattern follows, and a large colourless disk, with a well-defined edge, is left on the surface of the water. It undergoes some change, due to atmospheric exposure, but remains permanent for hours.*

Such is the figure produced by the various specimens of castor oil that I have examined. They are of different growths, but are I believe all pure, and supposing the specific gravity of all these specimens to be about 0·969 there is no reason why their cohesion figures should not resemble each other at about 60° F., which I take to be the mean temperature of an inhabited apartment both in winter and in summer. There are obvious reasons, with a viscid oil like castor, and other oils that are sensitive to cold, why this test should be applied at a genial temperature. Some of the animal oleines, for example, are solid at about 40°. These may be perfectly fluid in a warm room, but if water be brought in from a cistern at 40°, and be poured into the test-glass, the drop, as soon as it is deposited, will be chilled, and even become opaque, and the experiment fail; so that attention to temperature is important.

Another precaution refers to extent of surface. By increasing this we increase the adhesive force, and the figures may be poor and thin, and even torn up, before their characters can be studied. I have found a surface of four or four and a half inches in diameter well adapted to this inquiry.

Now comes the question of admixture of oils. Castor oil is so abundant and so cheap that there is no great inducement, so far as I know, to mix it with an inferior oil, supposing one very much cheaper could be found. But let us imagine that lard oil, for example, were wanting employment in the market, and that as a secondary product it could be obtained cheaply,—could the admixture be detected by this method of cohesion figures? My answer is, that in all the cases of admixture which I have examined, the features of the two oils are manifest in the cohesion figure; and these are, in general, very distinct, if the standard figure be examined by the side of the suspected figure. My memory is sufficiently retentive of these figures to enable me to tell immediately whether a figure varies from my standard. Not that my standard is necessarily the correct one; because in all cases I have had to depend upon others for the integrity of my specimens; and, in like manner, the gentlemen who have supplied me,

* An engraving, with explanatory notes, will be given in our next number.

may in their turn have to depend upon others. So that the production of an undoubted specimen is not always easy, unless prepared at home, which is also not always easy. At the International Exhibition I often watched the process of crushing linseed and expressing the oil; and I obtained specimens of the product, including the seeds. Now, thought I, I have an undoubted specimen of linseed oil; but on examining the seeds they were found to be mixed with about *one-fifth* of other seeds, so that my specimen of linseed oil from this source could not be relied on. Other circumstances may modify the cohesion figure, such as differences in the climate, or in the season under which a crop is gathered. Thus, oil of lavender varies somewhat in specific gravity in different years from the same farm, and I have observed that the beautiful carrageen-moss pattern produced by this oil is more minute in some specimens than in others; but the pattern is still the same, in the sense that the Queen's head is the same, whether seen on a sovereign or on a half-sovereign.

In general, when there is an admixture of oils the characters of the two figures appear at once. Thus, olive oil has its cohesion figure; oil of sesame, with which it is often mixed, has quite another figure; a mixture of the two in various proportions will give a figure which is neither that of olive oil nor of sesame, but giving the characters of both, leaning of course to the side of that which is in excess. In some cases, however, the characters of the added oil do not at once appear, and this is the case when lard oil is added to castor. The figure opens in the same beautiful manner, and goes through its lovely phases, with a difference, it is certain, that requires a practised eye to detect; but there is no difficulty in detecting the lard oil among the residual phenomena of the experiment. Outside and beyond the castor-oil figure, we have numerous small blotches of lard oil, which are entirely absent from the residual phenomena of the pure castor-oil figure. I have selected lard oil as being the most common source of admixture; I suppose as much as ten per cent. might be added without greatly reducing the viscidity of castor oil. Doubtless any large admixture, if it were worth while, of olive, nut, etc., oils, would be at once seen by the increased fluidity of the castor oil; but I do not imagine any difficulty in detecting these oils in the mixture, their nature, and even amount (roughly) by means of their cohesion figures.

I do not give diagrams of the figures produced by these various admixtures. The subject requires an education of the eye, which is soon completed, as far as the figures are concerned, for any one who works at the subject; and no one can work at a subject long without getting that technical kind of familiarity which no books or graphic illustration can supply.

Croton oil furnishes a magnificent cohesion-figure which may be represented as a very enlarged pattern of that of castor oil. Whether a small admixture of croton oil, such as one per cent. with castor oil, could be detected by means of the resulting figure, I am not yet prepared to say. I think there is no difficulty in detecting five per cent.

Oil of turpentine forms a very characteristic figure. It flashes out on the surface of water into a large well-defined film, the edge is marked by a double row of small bosses, the outer being the smaller; in the course of a few minutes irregular patches of iridescent colour appear on the surface, the film then becomes perforated by a multitude of minute holes, and the fourth and final stage is an exceedingly delicate resinous network, which is very permanent. Oil of turpentine is, I am told, sometimes mixed with castor oil as a vermifuge. It is perfectly easy to detect the admixture by means of the cohesion figure.

I fear I have left myself but very little time for any remarks on balsam of copaiba. The readiness with which this substance unites with the oils, both fixed and volatile, renders an easy and reliable test desirable. A drop of the pure balsam spreading out with its cohesion figure on the surface of water is a magnificent sight. It consists of a succession of sharply cut, expanding, super-

posed disks, glowing with the most brilliant iridescent colours, of a lustre all but metallic. These disappear when the adhesion of the surface is satisfied, and a clean, sharply defined, colourless disk is left on the surface.

Now I am told that balsam of copaiba is often mixed with castor oil in various proportions, to the great embarrassment of the medical practitioner. He is taught by the older Pharmacopœias to shake up the balsam with alcohol; but as castor oil is also soluble in alcohol, the test is worthless. The magnesia test is troublesome, and a drop on writing-paper almost equally so; but a drop on the surface of water, so far as I have examined it, instantly detects the admixture. The castor-oil figure has narrow iridescent rings, and a wide and beautiful lace-border; the balsam figure has wide rings, a clean cut edge, and no border; but curiously enough, the mixture of the balsam with the castor oil gives a figure with no colour, and a scanty perforated border.

I have not tried this experiment with various proportions of castor oil. Indeed, my object to-night is not to lay before you a finished work, but rather to invite attention to the subject, and to court inquiry and examination. When I brought this subject before the British Association at Manchester two years and a half ago, my object was rather scientific than practical. I wished to establish the principle that cohesion asserts itself in the case of liquids in the production of definite figures, as it does in the case of solids in building up crystals. The principle has, I believe, been admitted; but I have made no great progress in its practical application, partly from the difficulty I have had in procuring pure specimens, and partly, I suppose, from my preference for scientific inquiry, rather than practical application.

In conclusion, I must thank Professor Bentley for a very good specimen of wood oil, which I believe has been imported as East India copaiba. It makes a very good figure, a sort of inferior copaiba figure on a small scale; but it cannot for a moment be mistaken for copaiba, or any other figure that I am acquainted with. I have not tried the effect of it when mixed with copaiba, nor have I had an opportunity of examining jatropa oil, which is sometimes mixed with copaiba. There can be no difficulty in detecting admixtures of turpentine by this method.

I must also take the opportunity of Professor Miller's presence here to-night, to thank him for the warm interest which he has taken in this subject from the first. He witnessed my earliest experiments, and it is owing to his encouragement and advice that I have been induced from time to time to push on with the inquiry.

Professor Miller, of King's College, said he felt great interest in the subject Mr. Tomlinson had brought before the meeting. He had had many opportunities of witnessing Mr. Tomlinson's experiments during the progress of his investigations. He had observed that there was one practical difficulty in arriving at precision in the application of this method of testing, which arose from the absolute necessity of having the glass containing the water chemically clean. It was very important to attend to this point, as an experiment would probably fail altogether from the absence of perfect cleanliness. Rinsing the glass with solution of potash, would be found the best means of bringing it into the required condition.

Dr. Attfield thought they were scarcely in a position to discuss the merits of the paper or to comply with the invitation of the author to express an opinion upon its practical value, as the subject was entirely new to them. He should like to know whether Mr. Tomlinson could lead them to expect that by taking advantage of the varying cohesive and adhesive powers in different liquids which might be used as beds on which to place the drops of oil, a cohesion figure might be obtained which would be characteristic of a given oil, and identify it in the presence of others.

Mr. TOMLINSON had tried some experiments with different liquids, but he thought water was that which would be principally employed. It could be easily obtained in a state of purity, and was cheaper than any other.

Mr. HANBURY inquired if it was necessary to use a magnifying glass for examining the figures.

Mr. TOMLINSON said the figures were always large enough to be thoroughly examined with the naked eye.

Professor BENTLEY could but express his admiration of the manner in which the subject had been brought before them. It was quite a new field of observation, but now that it had been introduced to their notice he hoped it would be further investigated and applied to practical purposes. The examination of oils and the determination of impurities in them was attended with many practical difficulties, and any process that would aid in these investigations would be very acceptable to those who had occasion to work upon the subject. Mr. Tomlinson had referred to balsam of copaiba as one of the oils that gave a characteristic figure; he should be glad to know if any experiments had been made with wood oil, which had been used as a substitute for, as also to adulterate balsam of copaiba. He had been requested by Mr. Deane to direct Mr. Tomlinson's attention to linseed oil, which at present was very difficult to procure of good quality.

Mr. TOMLINSON said he had experimented with wood oil and had noted the figure afforded with it, but he was not yet satisfied with his results, and intended to make some further experiments.

Mr. BURDEN supposed this method of testing would be applicable to cod-liver oil, and if it afforded a satisfactory means of detecting adulteration in that oil it would be valuable.

Mr. TOMLINSON had applied it to cod-liver oil, but he was not sure that the samples he had used were genuine.

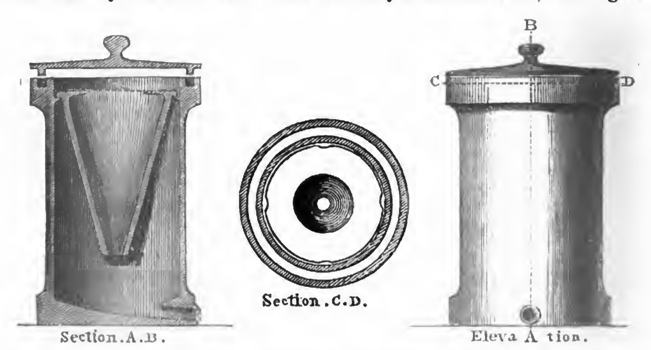
ON THE PROCESS OF PERCOLATION OR DISPLACEMENT AS APPLIED TO THE PREPARATION OF TINCTURES, AND ON A NEW FORM OF PERCOLATOR.

BY MR. SANGER.

There have already been published in the journals within the last two years some very excellent papers on this subject which treat of the results obtained by different operators; one in particular I might mention, by Mr. Proctor, but, as far as I can understand him, he, like those who preceded him, lets the difficulty of reducing the ingredients to a proper size, according to the different drugs, be the stumbling-block in the way of the general adoption of the process. Mr. Proctor's process entailed sifting the ingredients through sieves of certain dimensions, which is attended with a good deal of trouble, and by the separation of the more easily from the less easily pulverized portions of vegetable drugs is calculated to give uncertain results. On the other hand, when fine powders are used, they are liable to swell on being packed in the percolator and then wetted, and they thus become an impervious mass. It has been recommended, however, to obviate this inconvenience by treating the powder first with just sufficient liquid,—literally speaking, to lay the dust,—that is, so that the powder may be stirred about without the dust of it flying up, and yet not sufficient to make it into masses. I foresaw that it must not be with each drug I must battle, but that some insoluble ingredient must be found to divide the particles of the powder. I made experiments with two—powdered-glass and sand. The former I had to resign on the score of economy; and, as a useful ingredient, nothing equals pure silver-sand. This, however, has been opposed as being impure. So certain specimens may be, but, as a rule, it is very fairly pure; yet, as a pre-

caution, I think the following treatment good. Throw the sand into a large pan of water by degrees, stirring well; when all is in, allow it to settle, and decant the liquid as close as possible; then add some dilute hydrochloric acid, and stir the mass well; add some more water, stir and decant, and again drop the sand into water; collect and dry. By one manipulation sufficient of the insoluble ingredient may be prepared to last a chemist some considerable time; but, practically speaking, silver-sand is quite pure enough without this, and if there was any demand, would be sold ready-prepared by the wholesale druggists.

In making my experiments, I used various quantities of sand, with an aim to find out the smallest quantity available in any one set of ingredients to render them in the best state for operation. In most cases I found twice as much sand as the weight of the dry ingredients of the tincture to answer very well, but in a few cases a larger quantity was required. The following is the form of apparatus I have used, and which I find possesses several advantages over the other forms already in use. There are now commonly in use two kinds, one of glass



Section. A. B. Section. C. D. Eleva A tion.

and the other of earthenware. The former has several disadvantages; it is very easily broken, and when broken there is some trouble to get it replaced. To get at the liquid the upper vessel has to be lifted off at a certain amount of risk, and then it is a most difficult thing to clean it; while its only advantage is that you can see what is going on, and this is practically of no great use. The earthenware ones at present in use are very unsightly, and have the same disadvantages as the glass, except that they are not so readily broken; but for my percolator I claim these advantages:—first, it is not an unsightly object; it can be most readily cleaned out, as there are no sharp angles in its construction; all the process is conducted inside one vessel, and in its own atmosphere; it is not so likely to be broken while cleaning or in use; hot water can be used, so that it can be applied to the manufacture of infusions or extracts by percolation (of which subject I am not now treating); it can be used to filter anything through, and for a variety of other purposes; while, if one part gets broken, it can be replaced by others, for they would be made in different sizes, known by quantities, and each size would be moulded, by which means a stock would always be kept by the proprietors ready to fit; and I am assured, on good authority, that if made in quantities, they could be made sufficiently cheap to enable the manufacturers to supply them to the trade at little more than half the cost of those at present in use, thus meeting the wants of the chemist by providing a cheaper and more useful article. This one I have before me is but a model, being

scarcely large enough to make more than half a pint of most tinctures, but it will be sufficient to explain the method of procedure. In the first place, I have a jar with the base so rounded that any liquid poured in can be entirely drawn off without tilting the jar. The hole (while in operation) is to be corked, or, if preferred, a stopcock may be fitted to it. Inside this jar there are four brackets, moulded in the ware, for the funnel to rest upon. The funnel is made of such a length as to reach three-fourths of the way down the jar when resting on the brackets. The slope, or incline, is such as I found best for the funnel. The funnel is furnished at the base with a ring round it, so as to permit of the muslin and bibulous paper being tied on, as in capping a bottle. It has a double rim at the edge, the outer for the purpose of resting on the bracket, and this is notched in several places to permit of the air rising from the bottom of the vessel to the funnel above without the use of pipes or tubes; and the inner for the purpose of preventing the liquid in the funnel splashing over should the jar be moved while in operation, and also to enable the operator to take it out or put it in with the greatest possible ease; and, lastly, this outer vessel has a grooved rim, in which the edge of the lid fits. This I have filled with dry sand; the lid being placed on requires but a twist or two to render it sufficiently air-tight for all practical purposes. When this is wanted for use the funnel is removed, capped at the base, and the ingredients mixed with their quantity of sand stowed in it. A cork having been fitted to the hole at the bottom of the jar, the funnel is readjusted, the liquid is poured over the ingredients, the lid fitted, and the process of percolation goes on without any further labour. This percolator can be used by all those chemists who intend to adopt the process ordered by the College for the preparation of the tinctures. After the ingredients have been macerated the proper time they can be thrown into the funnel, which has been previously capped with filter-paper and muslin, and the process can be conducted as they direct without the danger of breaking the vessel, and the mass can be turned into the press more readily than from the old kinds. I have entered into arrrangements with Mr. Toogood, bottle merchant, of Mount Street, Grosvenor Square, to make these percolators for the chemists, and he will be ready to give every information that may be required.

In the discussion which followed the reading of this paper, Mr. Haselden advocated the use of metal percolators, as being most suitable for operations on the large scale, and he stated that he had been accustomed to use a percolator made of white metal, which answered very well. Mr. Farmer, of Putney, preferred a cylindrical tube to a conical one, and he used both glass and earthenware. Mr. Burden thought there were advantages in some respects in the use of glass percolators, but in operating on the large scale, others must be substituted. He liked the process of percolation for making tinctures, but he liked to perform the process himself, for there was too much skill required in conducting it properly, to admit of its being entrusted to unskilled operators. Professor Redwood spoke in favour of the glass percolator made by the York Glass Company, as a very convenient apparatus for operations on a small scale, and Ayliffe's stoneware percolator, where larger operations were required.

PHARMACEUTICAL SOCIETY, EDINBURGH.

A Meeting was held in St. George's Hall, George Street, on Tuesday evening, February 16th, at 9 o'clock; Mr. G. Blanshard, President, in the chair.

Dr. James Young read the following remarks on "Cicutine:"—

The question, What is Cicutine? may reasonably be asked by some here, as it has only recently been introduced as a medicinal agent, and has no place assigned to it in the British Pharmacopœia.

The object of the following remarks is to throw some light on the subject.

It will suit my purpose better to mention first the physiological action of the drug. before I make a few remarks on its histology. Case I.—In the month of November last, while I was in attendance on a lady from Fife, I had occasion to have a consultation with Professor Simpson relative to her complaint. When Dr. Simpson had carefully examined the patient—his diagnosis being neuralgia of the pelvic cellular tissue—he recommended me to put her immediately under Cicutine. I spoke to my friend Mr. Mackay regarding this new drug. He failed to obtain any of the granules in town, but speedily received some from London, or Paris, where the granules are prepared by M. Pelletier. I ordered this patient to take three of the granules per day, until she had taken some two dozen or more, with the most marked results; nay, let me tell you, her own remark was, "What a wonderful medicine!" This lady was requested to continue the same medicine after she went home if the neuralgic pain returned. Let me only add, that the pain of which she was relieved was constant and severe. Case II.—The next patient for whom I prescribed this medicine was the late Mr. H. He suffered for a long time from neuralgia of the extensor muscles of the lower part of the leg. In November, 1863, I put him under Cicutine granules, which he continued for a week, by which time he was completely relieved of pain, and continued so for four days; but on the fifth day the pain returned, and ultimately only yielded to the subcutaneous injection of morphia, and even that was but temporary, as the disease increased till he died.

When Dr. Christison saw Mr. H. with me, I told him of the great relief afforded to my patient by the use of Cicutine, which led to a conversation regarding this new remedial agent. Dr. Christison supposed, at first, that Cicutine was the alkaloid of *Cicuta virosa*, or Water Hemlock, which is not used in medicine, as it is considered a narcotico-acrid poison, causing true tetanic convulsions.

I told him that I understood Cicutine to be the same as Conëin. We accordingly met the next day and subjected one of the granules to a careful analysis, when Dr. C. and I distinctly traced in it the peculiar mousy odour of Conium. This Cicutine, then, is Conia, or Conicin, the peculiar alkaloid or active principle of Hemlock. Each granule contains $\frac{1}{80}$ of a grain of the alkaloid.

In Neligan's 'Materia Medica,' I find a recommendation of Conëin in neuralgic affections, as he has known it alleviate pain in doses of $\frac{1}{80}$ of a grain.

At page 233 of Dunglison's Medical Dictionary, I find Cicutine, or Conicine, mentioned as the active principle of *Conium maculatum*, and that either it or its salts have been given as sedatives to the nervous centres in neuralgic diseases.

Mention is also made of Cicutine by Dr. Justus Liebig under Volatile Bases, where he says that Conicine, or Cicutine, or Conin, was discovered by Gieseke, but first obtained pure by Geiger; that it occurs in *Conium maculatum*, having a formula of C_{16}, H_{15}, N, and symbol of Co×. It is easily miscible with alcohol or ether.

I have said that no place has been assigned to Cicutine in the British Pharmacopœia; I find, nevertheless, that Dr. Garrod, of King's College, in his last lecture on the British Pharmacopœia has some remarks on *Conium maculatum*, where he says that it owes its activity to its alkaloid Conia. He speaks of the tincture, Succus, but we fail to find any remark on the medicinal effect of the pure alkaloid alone.

I have prescribed Cicutine for many other patients besides the two mentioned, but I must refrain from any notice of them, as to the effects of the drug, as there has not been sufficient time, and one of the patients I refer to has gone to Dumfries; but I considered myself justified, from what we have already seen of this new remedy, in bringing it under the notice of the Pharmaceutical Society.

After some remarks by Mr. Mackay regarding the granules, and British Pharmacopœia preparations of Conium, a vote of thanks was proposed by the President to Dr. Young, seconded by Mr. Young, and carried with acclamation.

Mr. Moffat, chemist, Glasgow, was then introduced to the Meeting, and gave a very interesting description of the Freshwater Aquarium. His remarks were chiefly confined to British plants and fishes, with a view to enable any one who was so disposed to get up, with comparatively little trouble, such an aquarium as would be highly interesting. Referring to the provisions of nature for keeping up a true balance between animal and vegetable life, he illustrated this part of his subject both by experiment and diagram.

Mr. Moffat also spoke of the different modes of supplying air to the water, and gave a preference for this purpose to Stevenson's Aquarium Aerater, which was described some time ago in the 'Pharmaceutical Journal.' By the kindness of Professor Allman, several very beautiful coloured drawings were exhibited on the walls of the Hall, some of which were used by Mr. Moffat in illustration. At the close of the communication, a vote of thanks proposed by Mr. Ainslie, and seconded by Mr. Aitken, was unanimously carried. The Magnetic Hammer was thereafter shown.

Before the meeting separated, Mr. Mackay read the following circular, a copy of which had been sent to the druggists in Edinburgh and neighbourhood:—

"At a Meeting of Chemists and Druggists, held in 5, St. Andrew Square, on the 8th instant, Mr. Robertson in the chair, for the purpose of considering the changes rendered necessary by the publication of the British Pharmacopœia, it was agreed,—

"1. That it is desirable the formulæ of the British Pharmacopœia be adopted as speedily as possible. As, however, it may be presumed that many practitioners will continue to prescribe by the old formulæ, in order to guard against mistakes, it is recommended in the meantime, that a double set of bottles be kept where this is felt to be necessary.

"2. That all prescriptions of older date than the publication of the British Pharmacopœia be dispensed according to the formulæ then existing.

"3. That when a prescription is now dispensed, and any preparation of the British Pharmacopœia employed, this fact should be intimated by the insertion of the letters B. P. by the party by whom it is first dispensed.

"4. That when Liquor Taraxaci is ordered, the Succus Taraxaci of the B. P. is to be given; but when Extractum Fluidum Taraxaci is ordered, the dark-coloured preparation is to be used.

"5. That as the B. P. contains no directions as to the division of the pill-masses, it is agreed, unless otherwise specially ordered, that all the pills made according to the new formulæ weigh four grains instead of five, as has hitherto been the case, with the following exceptions:—Pil. Opii—Pil. Calomel. Co.—and Pil. Ferri Carb. Sacch.—which shall each weigh five grains."

A Meeting was held in St. George's Hall, 119A, George Street, on Monday evening, 22nd February; Mr. Blanshard, President, in the chair.

The following Notes on the British Pharmacopœia were read, and illustrated with specimens of a good many of the new preparations:—

NOTES ON THE PREPARATIONS OF THE BRITISH PHARMACOPŒIA.

BY MR. STEPHENSON.

Mr. President and Gentlemen,—My design in what follows is to do little more than indicate the variations in the formulas of the British Pharmacopœia, with especial, although not exclusive, reference to those of the Edinburgh College; and this with the view of fixing your attention and exciting your interest on practical details with which we have to do at every turn in our daily avocations.

Acid. Hydrochlor. Dil., *Acid. Nitric. Dil.*, *Acid. Sulphuric. Dil.* are all increased in strength. The hydrochloric, which was in the proportion of one part of acid to three of water, is now in the proportion of one to two and two-thirds; the nitric, formerly one to nine, is now one to six and a half; and the sulphuric, formerly one to thirteen, is now one to eleven and two-thirds,—changes which will not affect the dose, unless perhaps in the case of the nitric. *Acid. Nitro-Hydrochlor. Dil.* is the old nitro-muriatic acid, diluted with four and a half volumes of water, and supplies a want which has been much felt by dispensers. It admits of being given in the same dose as the others. The only nitric acid now recognized is the pure acid of sp. gr. 1·5. Any of you who have experienced the difficulty of preparing Liquor Ferri Pernitratis so as to keep unaltered, will find the difficulty removed by using this acid. *Acid. Hydrocyanic. Dil.* is now reduced to two per cent., and uniformity established throughout the kingdom,—a boon which I am sure we are all duly sensible of.

Aqua Camphoræ is directed to be made by enclosing the camphor in muslin, tying this to the stopper of the jar containing the water, inverting the jar, and allowing it to stand so for at least two days. All the other waters are to be prepared by distillation, but *Aqua Menth. Pip.* and *Viridis* are wisely ordered to be drawn from the oil,—a drachm and a half of English oil to the gallon. All the others are made from the raw materials—also a judicious direction. In *Aq. Lauro-Cerasi* the colouring-matter is omitted.

Confectio Piperis is a very different preparation from our old Ward's Paste, being now ordered without the Sweet Fennel (which gave it its distinctive flavour), liquorice, and sugar, and having a much larger proportion of honey, this being as three to one of the powders. This alteration will at least make it keep better than the old.

Decoct. Scoparii is to be made without the juniper.

Emplastrum Belladonnæ is one-half stronger, being now composed of equal proportions of extract and plaster. This is the same strength as the London formula; but instead of plain soap-plaster as there, we have now soap and resin plasters, equal parts, which is doubtless an advantage. The new form of *Empl. Calefaciens* is a great improvement. It is now prepared from a watery infusion of the flies, and forms a homogeneous plaster, which at once commends itself.

Liquid Extracts are a new introduction, in which the solvent is water alone, with rectified spirit added merely for preservation. In this category we have *Ext. Belæ Liq.*, *Ext. Cinchonæ Flav. Liq.*, *Ext. Ergotæ Liq.*, *Ext. Opii Liq.*, *Ext. Pareiræ Liq.*, *Ext. Sarsæ Liq.*, and we must hope to see many more articles added to it. It would form a most convenient and useful class of preparations, and probably supersede concentrated infusions. The principle in the case of the Bael, Ergot, and Pareira is to make a pound of the extract represent a pound of the drug operated on, and surely it would have been well to carry it out with the Cinchona and Sarsa also. An Extract of Cinchona of this strength would have the double advantage of being more reasonable in price, and of being taken in a more manageable dose. The process for the Ergot is worthy of remark. The bruised Ergot, before maceration, is to be percolated with Ether, which dissolves and washes away the poisonous oil without affecting the medicinal principle, the Ether itself having been washed to remove any alcohol, which, if present, might dissolve some of the active principle as well. *Ext. Opii Liquidum* is from the solid extract, one part to twenty, which, I suppose, is about half the strength of Battley's Solution.

Fel Bovinum Purificatum. It is a comfort to find a formula for purifying by means of rectified spirit the nasty ox-bile.

Infus. Aurantii is to be made without the cloves and lemon. *Inf. Calumbæ* is much stronger, being half an ounce to ten ounces, which seems the typical standard of strength in the infusions. *Infus. Chiratæ* and *Infus. Caspariæ* are directed to be made with water at 120°, the first being for half an hour, and the latter for two hours. *Inf. Digitalis* is only half the strength it used to be, and wants the spirit of cinnamon. The Edinburgh formula for *Infus. Gentianæ Comp.* is adopted. Our southern friends, in forming the acquaintance, must not forget that one-fourth part of it is proof-spirit. *Inf. Quassiæ* has double the quassia, and is made by infusing in cold water for half an hour. The change to cold water is for the better, forming a more elegant infusion, which has not the harsh taste acquired in the hot process; but surely there is a mistake about the time. *Inf. Rhei* is half the former strength, and without the cinnamon. *Infus. Rosæ* has the sugar omitted. The time of infusing is in most instances much shortened, and properly so.

Linimentum Aconiti is meant to supersede for external use Fleming's Tincture, and has been constituted a *liniment* to distinguish it from the *tincture*, which is now much weaker, for convenience of internal administration; but surely this

liniment, and the analogous one of Belladonna, are too strong. Twenty ounces of spirit will hardly exhaust twenty ounces of the root. Why not have left it at Fleming's strength? *Liniment. Ammoniæ*, instead of being one to two, is now one to three, which proportions mix more thoroughly. *Liniment. Camph. Co.* has now five ounces of Liquor Ammoniæ in the pint instead of three ounces, and the English Oil of Lavender is distinctly ordered. Surely in this case, as well as with Rosemary in Liniment. Saponis, we might have the option of using foreign oil. *Liniment. Cantharidis*, another new liniment, is a blistering liquid, very much stronger than the old Acetum, which it supersedes. It is made with ether, with a fifth of acetic acid. *Liniment. Chloroformi* is ordered with camphorated oil instead of olive, as we have been accustomed to. *Liniment. Iodi* is a concentrated tincture of Iodine introduced as a liniment, to prevent confusion with the ordinary tincture which has been weakened, and may be supposed as now meant only for internal use. Liniment. Iodi has about one hundred and ten grains of iodine, and somewhat less than half that quantity of iodide of potassium in each ounce, and is four or five times stronger than our Edinburgh tincture. *Liniment. Opii* is the same as our old Tinct. Saponis et Opii, but now made directly by mixing Tinct. Opii and Liniment. Saponis in equal proportions. This is double the strength of the late London formula. *Liniment. Saponis* is left substantially as it was in the London formula, viz. with one-tenth part of water. It is essential for the permanence of this liniment, that the temperature at which the solution of the soap is effected be not above 70°, as indicated in the formula, because, if that point be passed, it involves the subsequent gelatinization of the soap at low temperatures.

Liquor Ammoniæ Acetatis has five or six times the strength of the former, a fact which must be carefully kept in mind. One cannot help thinking it a pity we have not a Liquor Dilutus to represent the familiar Mindererus Spirit, in the same way as we have a Liquor Plumbi Dilutus. In this preparation we have the caustic ammonia employed instead of the carbonate, by which means we get rid of the troublesome carbonic acid. *Liquor Chlori* (quondam Aq. Chlorinei) is to be prepared by generating the gas from manganese and hydrochloric acid. No doubt this is the scientific plan, and yields the pure solution; yet many of us must regret not being allowed as heretofore to prepare it readily and easily by merely shaking together the red oxide of lead, chloride of sodium, and sulphuric acid, the appliances necessary for the other process being out of the reach of most of us, and the liquor, from its proneness to spoil, being hardly a marketable article. *Liq. Morphiæ Hydrochloratis* is now four grains to the ounce instead of four and a half, being exactly half the London strength, and has the addition of a little hydrochloric acid, which prevents the crystalline deposit on the inside of the bottle, and the tinge of colour in the solution which took place after a short time under the old formula. *Liquor Potassæ* is ordered to be made from slaked lime, with the corresponding increase in quantity, instead of lime-shell, which alteration is certainly an improvement.

Mistura Cretæ is to be made with cinnamon water instead of the spirit; also an improvement. In this, as in *Mist. Ferri Co.*, the proportions ordered are for eight ounces, a much more convenient quantity than twenty or forty.

Mucilag. Acaciæ has two ounces of gum to three ounces of water, instead of one to two, forming a preparation better for all purposes.

Pilula Calomel. Comp. Instead of treacle we have castor oil as an excipient, which will be found to make them better, and prevent their becoming so unsightly as before. *Pil. Cambog. Co.*, *Pil. Coloc. Co.*, *Pil. Coloc. et Hyoscyami* have Barbadoes aloes substituted for Socotrine. *Pil. Opii.* Here we have the London Pil. Saponis et Opii, containing one grain opium and four grains soap, introduced. In some cases this may be a desirable change, but I think an alteration to the small pills containing one grain of the powdered opium alone, in

each, and made with syrup, would have been more welcome, as their small size is generally a great advantage. I regret exceedingly to observe the omission of our Edinburgh Pil. Aloes et Ferri,—a pill, the extensive use of which by northern practitioners must have been unknown to the omitters.

Pulvis Aromaticus. We have here a powder composed of aromatics, with a predominating proportion of saffron, two-thirds of the whole also being refined sugar, taking the place of our old mixture of cinnamon, cardamom, and ginger in equal parts, and of the London Pulv. Cinnam. Co., which had the same composition slightly varied. I fear this is an inadequate substitute for its predecessor. The objections to it are—first, its difference in every respect from the old, especially in colour, and as containing so much sugar; and, second, the great difficulty, indeed impossibility, of preparing it satisfactorily without appliances which are beyond the reach of most of us. The powder has a similar composition (less the chalk) with the London Confect. Aromatic., which we find in its integrity over the page as *Pulv. Cretæ Aromaticus*, taking the place of our Pulv. Cretæ Comp., and with a fortieth part addition of opium, as *Pulv. Cretæ Aromat. c. Opio*, superseding our Pulv. Cretæ Opiatus. *Pulv. Jalapæ Comp.* has a slight addition of ginger. *Pulv. Scammon. Comp.* is quite different from the late Edinburgh powder. Instead of the scammony being merely diluted with an equal weight of bitartrate of potash, we have it mixed with jalap and ginger, conformably to the London formula.

Spirit. Ammoniæ Aromat. is ordered to be distilled from a mixture of the carbonate and caustic ammonia, which yields a product similar to the old London preparation, and the cloves and cinnamon are abandoned, the aromatics being lemon and nutmeg, which will prevent it acquiring colour by age. We have a new class of spirits introduced of *Cajuput*, *Camphor*, *Juniper*, *Lavender*, *Peppermint*, *Nutmeg*, and *Rosemary*, made from the essential oils, in the uniform proportion of one to nine. The camphor is less than half the strength of the London spirit, which was one to four, and a little weaker than the Edinburgh, which was one to eight. In *Spirit. Chloroformi* we have an authoritative decision on the long-vexed question of Chloric Ether. It is an exception to the rule of dilution, being one to nineteen, and so prepared, is quite soluble in water to a reasonable extent. *Spirit. Tenuior* is five to three of water, according to the London, being a little weaker than the Edinburgh.

Suppositories are directed to be prepared from the old unctuous ingredients. It is to be regretted that the cacao butter has not been recognized, as it is superior, in every respect, and must eventually come into general use.

We have a new kind of care manifested with regard to the syrups, being now told what the product in each case should weigh. This has evidently been ascertained by careful experiment as to their keeping qualities, and will save us much annoyance. We have *Syrup. Limonis* rendered much more elegant by the use of the peel as well as the juice. The use of rectified spirit in the process for *Syrup. Papaveris* is admirable, and renders it now a stable preparation. *Syrup. Sennæ* is a mild edition of our familiar fluid extract of senna, and might be made by percolation. The addition of the oil of coriander is very good. I may remark, in passing, that the sixteen ounces liquor obtained before adding the sugar, might constitute one of the liquid extracts formerly alluded to. For *Syrup. Tolutanus*, the London formula is adopted. This consists in boiling the balsam in water, which imbibes its aroma, and using this water to dissolve the sugar. It forms a very elegant syrup, much superior to our late one.

I dare say many of us have been expecting that the publication of this Pharmacopœia would settle the question as between percolation and digestion in preparing tinctures. There will be some disappointment to find that the dictum is essentially of the nature of a compromise. Perhaps it is better so, as we have in the directions given us, greater security for a better result on the whole. The

uniform formula (omitted, of necessity, only in such cases as aloes, assafœtida, etc.) is, "Macerate for forty-eight hours with three-fourths of the spirit, agitating occasionally, then transfer to a percolator, and when the fluid ceases to pass, pour into the percolator the remaining fourth of the spirit; afterwards press, filter, and make up the original measure of spirit." *Tinct. Aconiti* is evidently for internal use, the corresponding preparation for external use being *Liniment. Aconiti.* This tincture is about one-fifth or one-sixth of the strength of Fleming's Tincture, and about one-third of the London. *Tinct. Ferri Perchloridi* is to supersede our time-honoured *Tr. Mur. Ferri*, and is to be prepared by dissolving iron-wire in dilute hydrochloric acid, peroxidizing with nitric acid, and evaporating to a syrupy liquid, which is *Liquor Ferri Perchloridi*, having its own place in the Materia Medica. There is some difficulty in the preparation of this; care being required in the evaporation to secure complete peroxidation of the iron on the one hand, without driving off some of the hydrochloric acid on the other. Either error is detected by the tests; the former by the smell of nitrous acid, and the latter by its being not entirely soluble in rectified spirit. This liquor, with three volumes of rectified spirit, forms the tincture. Properly prepared, it constitutes an elegant tincture, similar in colour and flavour to that of the sesquichloride as made under the late formula, but, as we must assume, superior to it in other respects. *Tinct. Gentianæ Co.* is ordered without the cochineal and with cardamom instead of canella, which changes render it very different in colour and flavour from the former. *Tinct. Iodi* is about one-half the former strength, and has the addition of iodide of potassium, which makes it miscible with water, and so more suitable for internal use. *Tinct. Limonis* is a new tincture from the fresh peel. *Tinct. Lupuli* is made from the hop itself and proof-spirit, instead of lupuline and rectified spirit, and is a different article, but, I believe, more generally useful. *Tinct. Myrrhæ* is much stronger, being now one to eight, instead of one to eleven and a half. There is an evident wish to secure, wherever it is practicable, uniformity in the strength of tinctures,—two and a half ounces of the materials to one pint of spirit, or one to eight. This has occasioned many of the variations in the new formulas from the old; amongst others, in Digitalis, which is now one to eight, and used to be one to ten. Even taking into account the altered value of the ounce, this is an important change. In the same category we notice Catechu, Calumba, Gentian. Co., Tolu, and there are probably others. *Tinct. Opii* is an ounce and a half to the pint, which, taking into account on the one hand the loss of weight in drying the opium before it can be reduced to coarse powder as ordered, and on the other hand the altered value of the ounce, will leave it much as it was. *Tinct. Nucis Vomicæ* is now two ounces to the pint instead of five, which was inconveniently strong. *Tinct. Rhei* has saffron and coriander added, which improve it. *Tinct. Senegæ* is a new addition, and a very good one. *Tinct. Opii Ammoniata* is omitted.

Unguentum Cantharidis is to be prepared according to the Dublin plan, by infusion of the flies in oil. This will form an excellent issue ointment, and supersede our *Unguent. Inf. Canth.* We have almond oil instead of olive ordered for *Unguent. Cetacei* and *Unguent. Simplex.* It can be used unbleached, causing only the slightest tinge of colour, which is not objectionable. *Unguent. Creasoti* is three times the former strength. *Unguent. Gallæ* has a little more than half the galls, and *Unguent. Gallæ et Opii* about half the opium, which are both changes for the better. We have *Unguent. Aconitiæ*, *Unguent. Atropiæ*, and *Unguent. Veratriæ*, with eight grains respectively to the ounce of *Unguent. Simplex.* The cerates are now properly incorporated with the ointments.

Vinum Colchici is still ordered to be made from the corms. Surely it should have been from the seeds, it is so generally preferred so. *Vin. Ipecacuan.* is one to twenty, instead of one to sixteen. *Vinum Opii* is an ounce and a half to the pint, the same strength as the tincture, and as the opium is to be in rough

powder, it will be somewhat stronger than it used to be, and the aromatics are now omitted.

In addition to the foregoing, to which the limits of a paper like this necessarily restricted me, there are many other preparations, either new in themselves or from the other Pharmacopœias, which the wisdom of the Committee has found a place for in the present work. Such are *Collodium, Conf. Sulphuris, Conf. Terebinth., Ext. Filicis Liquid., Liniment. Terebinth. Acetic., Liq. Calcis Saccharatus, Syrup. Phosph. Ferri, Tr. Arnicæ, Belladonnæ, Cannab. Ind., Chiratæ, Conii Fruct., Ergotæ, Quinæ Comp., Sabinæ, Tro. Bismuthi* or Bismuth Tablet, and *Vinum Ferri.*

The Pharmacopœia Britannica is a very comprehensive subject, and will, I trust, on many future occasions afford matter for remark and discussion amongst us.

I have only, in conclusion, to express my wonder and delight at the manner in which this national work has been accomplished; not less as regards the knowledge and ability displayed throughout the work, than the admirable discretion and tact in the construction of the various formulas.

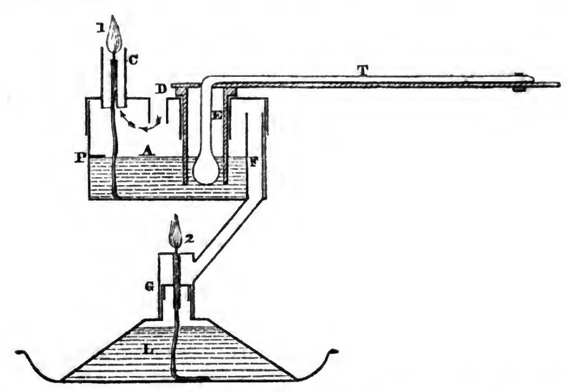
A long discussion ensued, in which Messrs. D. A. Brown, Ainslie, Nicoll, Aitken, Young, and Mackay, took part.

The President proposed a vote of thanks to Mr. Stephenson for his communication, which was carried unanimously and with acclamation. The meeting thereafter adjourned.

PROVINCIAL TRANSACTIONS.

LIVERPOOL CHEMISTS' ASSOCIATION.

The following is a description of Mr. Bird's Mineral Oil Tester, referred to in our last number, page 354.



A is a round box in which the oil to be tested is placed up to the little peg in its side, P. It has a well-fitting lid, having the three following openings:—C, a tube rising about half an inch above the lid, with a centre tube for holding a small wick; D, another entering the box, and E, a wider tube, in which the thermometer is fixed.

T, a maximum thermometer,—it has a brass tube protecting the bulb of the thermometer from injury, and enabling the thermometer to be easily placed in its position,—sliding into the tube E, in the lid. F, a tube passing through the bottom of the box, and terminating with a collar, G, which slides into the neck of the small lamp, L. The working of this test is as follows:—Place the oil to be tested in the box, A, up to the peg, P; put on the lid, and place the thermometer in the tube E, with the needle in contact with the mercury. Light the wicks 1 and 2, so as to have a flame about the size of a pea. The light 1 will cause a current of air up the little chimney, C, drawing air through the box down the opening D; and as soon as the oil rises to a sufficient temperature to give off vapour freely (the oil being warmed by the bottom light, 2), the vapour mixes with the air rising up the chimney, C, when it comes in contact with the light, and a little explosion or puff is produced, which blows out both the lights. The needle on the thermometer will give the temperature of the oil at which it gave off the vapour at any future time, as of course the moment the lights are extinguished the oil cannot get any hotter.

The whole apparatus fits into a wood box, six inches square. The box is so constructed that the front falls down, and allows of the testing being conducted in the box, a circumstance of no slight importance, for the testing being frequently conducted in draughty situations, the lights would be liable to be blown out if the apparatus were not in the box, the box acting as a screen. The thermometer fits in the corner of the box, in such a manner as to prevent its getting injured by carrying about.

N.B.—The apparatus is constructed so that it gives the exact point at which the oil would commence to burn in an open vessel, which is technically called the "igniting-point."

An animated and interesting discussion followed.

A vote of thanks to Dr. Edwards and Mr. Bird closed the proceedings.

The Seventh General Meeting was held at the Royal Institution, January 28th; the President in the chair.

The following gentlemen were duly elected Members:—

Messrs. E. Davies, B. Marsden, and W. A. Meadows.

A copy of the British Pharmacopœia was presented to the Library by the President.

Mr. N. Mercer referred in feeling terms to the death of Dr. Brett, who, in the early years of the Society had so ably and actively interested himself in its proceedings. Dr. Lodge and Mr. Abraham also bore testimony to Dr. Brett's eminent abilities, and expressed the great regret they felt in hearing of his death.

The paper of the evening was on "Sugar," but Mr. Outram, the author, kindly intimating his willingness to postpone the reading until a future evening, the evening was occupied by a discussion upon the British Pharmacopœia.

The Eighth General Meeting held at the Royal Institution, February 11th, 1864; the President in the chair.

The following gentlemen were duly elected Members:—

Messrs. Hatcher, A. H. Mason, Richard Challis, and S. Alefounder.

Several donations to the Library and Museum were announced.

Dr. Edwards stated he had received a printed copy of a requisition from the United Society of Chemists and Druggists, urging the necessity to incorporate their body with the Pharmaceutical Society, and to obtain an extension of the powers of the Pharmacy Act. He considered the United Society just twenty years behind the age, and in experiencing the difficulties the Pharmaceutical Society had encountered twenty years ago, he was not surprised to hear of the desire of their requisition, especially as the influence of the Pharmaceutical Society was now being felt of so great value, that scores of old members whose membership had lapsed through non-payment of their subscriptions, were coming forward to pay up their arrears even of nineteen years' standing. He concluded by urging all young men to prepare themselves now to pass the examinations of the Society, which eventually they would probably be compelled to submit to, to enable them to take a creditable position in their profession.

Mr. N. Mercer asked Dr. Edwards, as Local Secretary to the Pharmaceutical Society, if he was taking any steps to make known to the young men in the trade in Liverpool, the probability of the Council in London arranging for the holding of local examinations? He thought that young men ought to be accurately informed on the subject,

and was convinced great good would arise from the carrying out of the great desideratum, local examinations.

In reply, Dr. Edwards explained the course the Council had taken to ascertain the desirability of holding local examinations, and while the evidence collected was in the main favourable to the change, it was insufficient to warrant the Council in moving further in the matter than to appoint on the Board of Examiners a number of gentlemen from the great industrial centres of the country, thus preparing the machinery for action so soon as a sufficient requisition was received from provincial candidates for examination.

Mr. Mercer expressed dissatisfaction with this reply, and intimated he would renew the subject on a future occasion.

John Abraham, Esq., then opened a discussion on the British Pharmacopœia, commencing with the weights and measures, and commenting *seriatim* on the various changes in the Materia Medica. After a lengthened discussion, in which Drs. Nevins and Ayrton and several members took part, it was resolved to adjourn the meeting until Thursday evening, the 18th inst., at 8 o'clock.

CONVERSAZIONE.

The members and friends of the Association held a Conversazione on the 14th of January, at the Royal Institution. The doors were opened at half-past six o'clock, P.M., and in the course of a little more than half an hour about three hundred ladies and gentlemen had arrived, and were soon occupied in viewing the various subjects of interest which had been collected for the occasion in various parts of the building.

A large number of philosophical apparatus, works of art and manufacture, including mechanical figures, new timekeepers, some very beautiful photographs and stereoscopic views which attracted much attraction, and other interesting objects were exhibited in the museums, the whole of which, together with the gallery of art and museum of economic science, were thrown open to the company. Several members of the Liverpool Natural History and Microscopic Society, and the Microscopic Club, very kindly attended with their microscopes and exhibited numerous interesting objects.

Mr. Carr, of Birkenhead, exhibited his newly-invented drug-grinding machine, with which several members expressed themselves well pleased, especially with regard to its portability.

Mr. T. J. Moore, by the permission of the Free Library and Museum Committee, exhibited some very interesting additions which have recently been made to the Free Public Museum, and these included a large specimen of the sun-fish, five feet in length, captured off the south-west coast of England; a fine specimen of the reindeer, one of a pair from Norway; two large sponges, called "Neptune's Goblets," from Sincapore; twelve models of Hindoo and other natives of Bengal; models of ichthyosaurus, plesiosaurus, iguanodon, etc.; specimen and cast of pterygotus of large size from the Upper Ludlow lock, Lesmahagow, known to quarrymen as the "seraphim;" portions of the skull, jaw, and dermal plates of trematosaurus, a labyrinthodont reptile allied to that which produced the footprints at Stourton quarry; the skull, jaws, and other bones of a large specimen of the great fossil cave bear, from Arriége, in the south of France, one of the extinct species contemporary with prehistoric man; and fishes from America, imported by Capt. Mortimer, Associate of the Literary and Philosophical Society of this town. Not the least interesting objects were six of the new Dircksian phantasmagoria, illustrating the marvellous optical illusions constituting "the Ghost," as produced in the 'Spectre' drama. These were exhibited by Messrs. Horne and Thornthwaite, the manufacturers, through the courtesy of Mr. Henry Dircks, C.E., the inventor. There was also a larger one which Mr. H. S. Evans, the honorary secretary of the Chemists' Association, had had constructed. This attracted much attention, and considerable difficulty was experienced by visitors in getting near it, on account of so many desiring to see the phantom. In the course of the evening Mr. Evans explained the principle of the production of the illusion, in the large lecture-room, by means of a coloured diagram.

At half-past seven, the chair was taken in the large lecture room, by Mr. Shaw, the President of the Association, who expressed the gratification which he felt at seeing so large an audience, and was especially pleased to find that they were honoured with the presence of a very considerable number of ladies, remarking that the large attendance that evening was evidence of the continued and increasing vitality of the Chemists' Association. After acknowledging the obligation of the council to several kind friends who had contributed

objects of interest for the meeting, he called the attention of the audience to the more intellectual and interesting part of their evening's entertainment as announced in the programme, namely the lecture which was about to be delivered to them by Professor T. C. Archer, F.R.S.E.

He observed that Prof. Archer needed no introduction by him to that meeting, he was well known to the Liverpool public, and especially to those who were in the habit of attending the scientific meetings held in that Institution, and as regarded the Chemists' Association he had been for many years one of its most esteemed honorary members, and by his lectures, etc., had contributed materially towards the success and present position of the society. He was exceedingly glad to see him there on that occasion. He then called upon Professor Archer to favour them with the lecture, "On recent Improvements in the Manufacturing Arts."

Professor Archer, on rising, was received with hearty manifestations of welcome and applause, and at once proceeded with his address. The lecture was divided into two parts,—1st, Metallurgical and Mechanical; 2nd, Miscellaneous,—and was illustrated by models, diagrams, etc.

He described Bessemer's and Krapp's methods of manufacturing steel, the first being by forcing the carbon through the metal, and the latter by forcing the metal through the carbon. He referred to the gigantic machinery in use at Messrs. Horsfall's Mersey Steel Works, and the marvellous work which is performed there. After describing, in a very lucid manner, a new mode of supplying locomotives with water and fuel whilst they are in motion, the lecturer gave a very interesting description of Mr. Whitworth's measuring machine, and the wonderful results which had followed its invention and use, axles and other parts of machinery being worked to the thousandth part of an inch. He concluded by a graphic description of Giffard's injector.

At the termination of the first part of the lecture, which occupied nearly one hour, an interval of one hour took place for refreshment, promenade, etc.; and during which Dr. Edwards exhibited, by means of the electric lamp, spectra of a number of the metallic elements, to a considerable portion of the company, who appeared much interested in this comparatively recent discovery.

At half-past nine Professor Archer proceeded with the second part of his lecture, commencing with an explanation of cotton, woollen, and lace manufactures. He then described a type-setting and distributing machine, which he said was in use in many large towns in the country. After describing a very ingenious method of veneering both plain and carved work, the lecturer explained the process of photo-zincography, and concluded with exhibiting and describing a very ingeniously-contrived instrument called the telephonium. Professor Archer was repeatedly applauded in the course of his lecture, and at its close a vote of thanks was accorded to him on the motion of Mr. Abraham, seconded by Dr. Nevins, the latter gentleman stating that he did not think that any one could have gone through so much interesting matter in so short a time.

Mr. M. Murphy, F.C.S., then exhibited and explained the construction of Gore's gas-furnace.

The meeting, which had been a most interesting one throughout, was brought to a close a little before eleven o'clock.

NOTTINGHAM CHEMISTS' ASSOCIATION.

The Fifth General Meeting was held in the new rooms of the Society, Exchange Buildings, on Thursday evening, the 28th ult.; Mr. S. Parr, F.C.S., President, in the chair.

The minutes of the preceding meeting having been read and confirmed, the Secretary acknowledged the receipt of the 'Pharmaceutical Journal' from the Pharmaceutical Society, the 'Chemical News' and the 'Chemist and Druggist' from their respective editors.

The President congratulated the members on their first assembly in the new rooms, which proved the sincerity and progress of the Society, stating, at the same time, that the rooms would be open every evening except Saturday, as a library and reading-room, from eight until ten. He also congratulated the members of the medical profession on the advent of the long and anxiously looked-for British Pharmacopœia,—a work which, although not perfect, was an incalculable improvement on the old one. He had great

pleasure in announcing to the meeting that Mr. J. H. Atherton had promised to read a series of papers on the Preparations in the new Pharmacopœia. He thought they would be of great use and benefit to the Society, as showing the difference between the old and new preparations, the reason of the change in their manufacture, and the improved method of testing their strength and purity.

The President then called upon Alexander Butel, Esq. (an honorary member), to deliver the lecture of the evening, on the "History and Manufacture of Sulphuric Acid."

The Lecturer traced the history of this acid from its earliest date, and showed the different methods adopted in its manufacture, improvement upon improvement, up to the present time. The Lecturer said,—"Thus by the action of sulphuric acid, we produce tartaric, stearic, phosphoric, and a great many other acids. By it we create our sulphates, we obtain our alkalies, we generate chlorine to disinfect the sick chamber, or bleach our cotton and linen fabrics; our soda-ash and caustic soda are now entirely manufactured by that powerful agent, and we are thus enabled to vitrify cheaply common sand, and give rise to those many industries connected with the production of glass. Our soap-boilers can thus manufacture at an almost nominal price the goods by which cleanliness has found its way amongst the poorest cottages. By means of its corrosive action we thoroughly scale those thin sheets of iron which are afterwards impregnated with tin or zinc; thus forming our tin plates and our galvanized iron, which defy the oxidizing action of air, water, or gases. The reaction of sulphuric acid on zinc produces an electric current, by which electro-plating is performed, and enabling the man of moderate means to cover his table with a brilliant display of silvered spoons, forks, castors, etc. Then sulphuric acid creates almost entirely those artificial manures by which the farmer has within the last twenty years more than doubled his crops, and thereby increased his cattle and improved his bread. Need I say that the dyer, the tallow-bleacher, the soda-water manufacturer, the bleacher, and almost every branch of manufacture, is more or less dependent on sulphuric acid. Thus we perceive that sulphuric acid is an article of general use in the arts and trades. We must admit that it is the principal agent by means of which our gigantic soap manufactories, alkali-works, our dye-works, and, indirectly, the great cotton mills, the woollen establishments, and many branches of our metallurgic manufactories, have been erected; that it is one of those great means of production which create those innumerable articles of commerce which, when loaded in our merchant vessels, find their way to the extremities of the earth; thus disseminating, in a gradual, unobtrusive manner, the substantial benefits of our civilization among those tribes and nations where barbarism is not yet displaced."

The Lecturer then proceeded to explain the chemical composition of the substances from which it is produced, and the decompositions necessary for its formation; afterwards going minutely through the details of its manufacture, from the burning of the sulphur to the bottling of the acid. The lecture was admirably illustrated by models, a complete set of which was expressly prepared for the occasion, and presented to the Society by the Lecturer.

After a few remarks from the President and Dr. Tatham, Mr. Atherton proposed that the cordial thanks of the meeting be given to Mr. Butel for his most interesting and instructive lecture, which was seconded, and carried with acclamation.

Mr. Butel, in responding, stated that he should be happy at some future time to appear before them again. The meeting was very numerously attended.

LECTURES ON THE BRITISH PHARMACOPŒIA.

ON THE CHEMICAL PROCESSES AND PREPARATIONS.

Lecture I.

Delivered before the Members of the Pharmaceutical Society, February 17, 1864.

BY THEOPHILUS REDWOOD, PH.D., F.C.S.,

PROFESSOR OF CHEMISTRY AND PHARMACY TO THE PHARMACEUTICAL SOCIETY, AND SECRETARY TO THE CHEMICAL SOCIETY.

The advent of the British Pharmacopœia forms an epoch in the history of Medicine in this country. For nearly two centuries and a half the Pharma-

copœia of the London College of Physicians has been the authorized guide to which medical prescribers and dispensers throughout the greater part of the British dominions have looked for instruction with reference to the composition and preparation of medicines. For more than a century and a half there has been a separate guide, originating from a different source, and having exclusive authority in Scotland; while in Ireland, for rather more than half a century, the Dublin Pharmacopœia has occupied a similar position among physicians and apothecaries in that country. The existence of these different guides, relating alike to the preparation of medicines for the inhabitants of the same kingdom, and ordering in many instances under the same name preparations differing in composition or strength, has long been felt to be a serious evil; and for this the Medical Council have provided a remedy in the production of the British Pharmacopœia.

Nobody doubts that the publication of this work has been a wise measure, for which there was urgent occasion. The book which will now be the only authorized guide on the subject to which it relates "throughout Great Britain and Ireland," has been prepared under circumstances calculated to give to it a high degree of authority. Never before has there been such a combination of talent associated for the production of a Pharmacopœia in this country; and if the measures adopted should be found to have failed in realizing the expectations that have been formed, it will not be from a deficiency of labourers or of labour employed in the work, but rather, it may be, from an error in the opposite direction. Some disappointment, indeed, has already been expressed; but it must be admitted that the committees sitting in the three capitals of England, Ireland, and Scotland, representing the medical practice, and influenced as they would necessarily be to some extent by the peculiarities in the medical treatment which custom has established in those separate parts of the kingdom, have had no easy task to perform in reconciling differences, and producing a rule and guide for medical and pharmaceutical practice that shall be applicable and acceptable throughout the British dominions.

The work has been looked for with great expectations; and now that it has arrived we are all anxious, not only to read, but diligently to study it, and to become acquainted with the substances to which it refers—with its descriptions of drugs, and its processes for the preparation of medicines.

There is no part of the great body of medical practitioners to whom the study of the Pharmacopœia is more interesting and important than it is to the pharmaceutical chemist. He has not only to become acquainted with the composition, the characters, and properties of the medicines which are ordered, but he must study, and should thoroughly understand, the nature of the changes which occur in their production, the extent of the adaptation of the processes given for the purposes for which they are intended, and the means by which the apparent intentions of the authors may be most effectually realized.

It is with the view of promoting and facilitating the study, the comprehension, and appreciation of the changes which are effected by the introduction of the British Pharmacopœia, that my colleague and myself, at the request of the Council of this Society, are about to deliver a few lectures here during this and next month. It is proposed that I should describe and explain the processes and preparations, both chemical and galenical; while my colleague, Professor Bentley, will describe and explain the Organic Materia Medica.

In this lecture I shall confine myself to the chemical preparations, leaving the galenical preparations for a subsequent lecture. My object, of course, will be to show the influence of the introduction of the British Pharmacopœia upon the practice of pharmacy. We have to consider what are the changes this work proposes or is calculated to effect. There are some medicines omitted now which were previously ordered; some medicines introduced now which were not pre-

viously recognized; some old medicines designated by new names; and some new medicines called by old names. Moreover, there are new processes, the products of which are not very, or not at all, different from those produced by the processes previously adopted; and there are new or extended or altered descriptions of the medicines referred to in the book.

For the better comprehension of these changes, I have tabulated the results of the comparison of the British Pharmacopœia with the London Pharmacopœia of 1851; and I confine myself to the London Pharmacopœia, because I am addressing those who have been accustomed to recognize it alone as their authorized guide.

1. *Chemical Preparations in the London Pharmacopœia*, 1851, *but not in the British Pharmacopœia.*

Acetum destillatum.
Ammoniæ citratis liquor.
———— sesquicarbonatis liquor.
Arsenici chloridi liquor.
Atropiæ sulphas.
Calamina præparata.
Cornu ustum.
Cupri ammonio-sulphas.
———————— liquor.
Ferri ammonio-chloridum.
Hydrargyri bichloridi liquor.
———— bisulphuretum.
Morphiæ acetas.
Oleum æthereum.
Plumbi iodidum.
Potassa cum calce.
Potassæ carbonatis liquor.
Sodæ sulphas.
Sulphuris iodidum.

There is very little to be found in this list that will cause any feeling of regret. Two or three old friends there may be, but we shall soon be reconciled to the loss of them. Thus, there might perhaps be a word said in favour of distilled vinegar, which for certain purposes, such as the preparation of Mindererus's spirit, may be preferred to the dilute acetic acid that now represents it. But Mindererus's spirit itself is changed, and the new spirit is but the ghost of the old preparation. Like other ghosts, it lacks the essential qualities of the original; nay, it even lacks the spirit of the ghost, for none of the spirit is there, and it is as unlike the true Mindererus's spirit as a glass of vapid distilled water is unlike the sparkling crystal water as it springs from a gushing fountain. Mindererus's spirit, as it used to be, with its agreeable briskness, due to the use of carbonate of ammonia, and its faintly vinous ethereal flavour, due to the use of distilled vinegar, will, no doubt, still have its advocates. The new Liquor ammoniæ acetatis is made with the strongest caustic solution of ammonia and strong acetic acid, which is rarely entirely free from sulphurous acid, and never possesses the agreeable flavour of distilled vinegar. There may also be advocates for De Vallengen's solution of chloride of arsenic; but the loss of this preparation may be considered to be pretty well compensated for by the retention of the older and better-known Fowler's solution.

With these exceptions, there is nothing in the list of omissions with reference to which there can be much difference of opinion. Who will regret the loss of the old form for the worthless imitation of Dr. James's powder, or the costly and unproductive process for the practically unattainable, or if attainable, unpreservable compound called oil of wine? These may be allowed to pass quietly into oblivion with Cornu ustum and Company.

2. *Chemical Preparations in the British Pharmacopœia, but not in the London Pharmacopœia*, 1851.

Acidum aceticum glaciale.
——— nitro-hydrochl. dilut.
——— sulphurosum.
Aconitia.
Ammoniæ benzoas.
———— phosphas.
Antimonii oxidum.
———— terchloridi liquor.
Beberiæ sulphas.
Calcis carbonas præcipitata.
——— hydras.
——— phosphas præcipitata.

Calcis saccharatus liquor.
Chlori liquor.
Chloroformi spiritus.
Collodium.
Digitalinum.
Fel bovinum purificatum.
Ferri arsenias.
—— et quiniæ citras.
—— oxidum magneticum.
—— perchloridi liquor.
—— pernitratis liquor.
—— peroxydum hydratum.
—— phosphas.
—— sulphas granulata.
Ferrum redactum.
Hydrargyri iodidum rubrum.
———— nitratis acidus liq.
Lithiæ carbonas.
—— citras.
Magnesia ponderosa.
Magnesiæ carbonas pond.
Plumbi carbonas.
Potassæ citras.
—— permanganas.
———— liquor.
Potassii bromidium.
Santoninum.
Sodæ arsenias.
———— liquor.
Spiritus pyroxylicus rectificat.
Zinci acetas.
—— carbonas.
—— chloridum.
—— valerianas.

This list, which is much longer than the preceding, affords more room for criticism, and more ground for differences of opinion. If fault be found, it will probably be on the ground of deficiencies in the list, rather than on that of redundancy. It appears to me to contain a judicious selection of such medicines of the class now under notice as have the strongest claims to recognition.

3. *Old Chemical Preparations with New Names.*

Old Names.	New Names.
Ammoniæ sesquicarbonas.	Ammoniæ carbonas.
Antimonii oxysulphuretum.	Antimonium sulphuratum.
———— potassio-tartras.	———— tartaratum.
Bismuthi nitras.	Bismuthum album.
Calx chlorinata.	Calx chlorata.
Chloroformyl.	Chloroformum.
Ferri ammonio-citras.	Ferri et ammoniæ citras.
—— carbonas cum saccharo.	—— carbonas saccharata.
—— potassio-tartras.	Ferrum tartaratum.
—— sesquioxidum.	Ferri peroxidum.
Hydrargyri ammonio-chlorid.	Hydrargyrum ammoniatum.
———— chloridum.	Calomelas. Hydrargyri subchloridum.
———— bichloridum.	Hydrargyrum corrosivum sublimatum. Hydrargyri chloridum.
———— iodidum.	———— iodidum viride.
———— nitrico-oxidum.	———— oxidum rubrum.
Iodinium.	Iodum.
Magnesia.	Magnesia levis.
Magnesiæ carbonas.	Magnesiæ carbonas levis.
Plumbi oxidum.	Lithargyrum.
Potassæ bitartras.	Potassæ tartras acida.
—— hydras.	Potassa caustica.
Potassii sulphuretum.	—— sulphurata.
Quinæ disulphas.	Quiniæ sulphas.
Sodæ chlorinatæ liquor.	Sodæ chloratæ liquor.
—— potassio-tartras.	—— et potassæ tartras.
Spiritus ætheris nitrici.	Spiritus ætheris nitrosi.
Sulphur.	Sulphur sublimatum.

With regard to this list I have not much to say, beyond expressing regret that, in addition to the revival of the old names "*calomel*" and "*corrosive sublimate*" for the two medicinal chlorides of mercury, a change should also have

been made in the more scientific names of these medicines, by which the term "*chloride of mercury*," which has for so long a time been used to designate calomel, is now made to apply to corrosive sublimate. Any change of chemical nomenclature, as applied to medicines, could hardly have been made at a more unsuitable time than the present; for the whole system of chemical nomenclature is just now undergoing revision by scientific chemists, and great and important changes will, no doubt, shortly be made—indeed, they are now in progress, and will probably render the new scientific names introduced into the British Pharmacopœia as much behind the requirements of modern science as those which have been superseded. It would have been much safer and better to have left the old scientific names of the chemical substances used in medicine unaltered, excepting where it was thought that such names could be altogether dispensed with, as in the cases of calomel and corrosive sublimate.

4. *New Chemical Preparations with Old Names.*

Acidum aceticum.	Acidum sulphuricum dilutum.
——— aceticum dilutum.	Ammoniæ acetatis liquor.
——— hydrochloricum dilutum.	Magnesia.
——— nitricum.	Magnesiæ carbonas.
——— nitricum dilutum.	Morphiæ hydrochloratis liquor.
——— sulphuricum.	Potassæ carbonas.

These changes are of comparatively little importance, as they only affect the strength of the preparations. I shall have by-and-by to refer again to these changes of strength; at present, I merely allude to the effect of retaining the names unaltered when the preparations have been changed. As a rule, I should be disposed to say, with reference to the preparations used in medicine, that, when any important changes are made in the composition or strength of such preparations, they should be distinguished from those previously used by some change of name. I do not think, however, that this rule could with advantage have been applied to any of the preparations in the list before us. If there is anything to regret, it is, with reference to some members of the group, that any change should have been made in the preparations themselves; the names have been rightly left as they were.

5. *Substitutes for Old Chemical Preparations under New Names.*

Pulvis antimonialis for Pulvis antimonii compositus.
Acetum Gallicum for Acetum Britannicum.
Carbo animalis purif., from bone-black, for Carbo animalis, from bullock's blood.

In this short list we have an efficient antimonial powder, which can be always produced in a uniform state, as a substitute for the old, inactive, and uncertain Pulvis antimonii compositus. We also have purified animal charcoal from bone-black, as a substitute for the charcoal prepared from blood. These changes are much to be commended; but I am not so sure that the substitution of French vinegar for British vinegar is a judicious change. I have never found any difficulty in getting perfectly good British vinegar, but much difficulty in getting good French vinegar; nor do I think that the so-called French vinegar met with in this country is better in any respect than the best British vinegar. The Pharmacopœia says that the vinegar used in medicine is to be "impure dilute acetic acid, prepared from French wines by the acetous fermentation." But I understand that what is generally sold in this country as French vinegar is made in this country, and certainly is not made from French wines by the acetous fermentation. This, however, is not an important matter, for it does not appear that this vinegar is ordered in any of the preparations in the Pharmacopœia, and for what purpose it is retained at all in the Materia Medica, I am unable to conceive. The old class of "vinegars" are altogether discarded, and French vinegar alone is retained.

And now, having sketched out the general purport and extent of the changes made in the chemical preparations of the Pharmacopœia, I must direct your attention to some points in connection with those preparations which appear to claim particular notice.

Acidum aceticum.—The acid ordered under this name is not quite so strong as that of the London Pharmacopœia. It now contains 28 per cent. of anhydrous acetic acid, while the acid of the London Pharmacopœia contained 30·8 per cent. There is no process given for its production, and I think it is much to be regretted that the example thus set was not more generally followed with other chemical preparations. Besides this form of acetic acid, however, there are three others ordered.

Acidum aceticum glaciale is described as monohydrated acetic acid—that is, anhydrous acid with one atom of water. In this case, in addition to the description, which is given pretty fully, there is also a process given, and from the manner in which this is described, it might be inferred that this glacial or monohydrated acetic acid may be readily produced; but any one who tries will soon discover that such is not the case. In fact, the monohydrated glacial acetic acid cannot be obtained at all by the process given. It may be said that this is not of much importance, as the glacial acid can be obtained in commerce without any difficulty, and cannot be successfully produced upon other than the large manufacturing scale. It this be so, as undoubtedly it is, why should the Committee have undertaken to give a process? If they had rested satisfied with describing the preparation they wished to be used, as they have done in the case of *Acidum aceticum*, they would have avoided the inconsistency of describing the product in one part of the work as a body having certain characters, and answering to a chemical formula which very precisely defines its composition, while in another part of the work they give a process which fails to yield the product they have described.

Acidum aceticum dilutum is weaker than the diluted acid of the London Pharmacopœia; in fact, it is only about three-fourths of the strength of that acid. One fluid ounce of it is neutralized by 9·6 grains of soda (NaO), while the same quantity of the London acid requires 12·6 grains of the same alkali. It may be remarked here that while the diluted mineral acids—that is, the hydrochloric, nitric, and sulphuric—have been equalized in strength, and made to contain as many grains of the acid in six fluid drachms as represents the atomic weight of the acid in each case, the diluted acetic acid is much weaker than this, and requires more than four times that quantity to represent the same strength.

Acidum hydrochloricum.—This acid is to be rather stronger than that ordered in the London Pharmacopœia, but the difference is slight, and I have therefore not represented it as a new or altered preparation. It is now to have a specific gravity of 1·17, instead of 1·16 as formerly. In the last London Pharmacopœia there was no process given for the preparation of hydrochloric acid, although a good process was contained in the Pharmacopœia of 1836. A process is now again introduced, which, although in some respects a very good one, is in one respect defective. The process of the British Pharmacopœia is practically that of the late Dr. Gregory, of Edinburgh; and its peculiarity consists partly in the use of two atoms instead of one of sulphuric acid to every atom of chloride of sodium, so that bisulphate instead of sulphate of soda results from the decomposition; and partly in the dilution of the sulphuric acid with water until it has a specific gravity of about 1·6. The result of thus diluting the sulphuric acid and using it in increased quantity is, that it is less likely to yield sulphurous acid when it comes into contact with organic impurities in the common salt, and that in other respects it facilitates the process and yields a purer product. The apparatus as described in the British Pharmacopœia is here fitted up, and the

materials are put together as directed; but in consequence of the unfortunate omission in the directions to which I have alluded, the process, when conducted strictly according to the book, yields no hydrochloric acid. The fact appears to have been overlooked by the writer of the article describing the process, that when the sulphuric acid is used in this state of dilution, the hydrochloric acid is not given off without the application of heat. On supplying that omission, however, the process, as you will perceive, will proceed in a very satisfactory manner, and a perfectly good product will be obtained. I do not consider the increase of strength in this acid, as compared with that of the London Pharmacopœia, to be an advantage, but rather the reverse, as it has a greater tendency, in consequence, to throw off vapours when exposed to the air, and there is no purpose that I am aware of to which it is applied where the weaker acid would not answer equally well.

Acidum nitricum.—There are many present, no doubt, who will recollect the nitric acid of the London Pharmacopœia of 1836, and the trouble and annoyance attending its use. We all rejoiced to find that in the Pharmacopœia of 1851 a weaker acid was ordered—an acid easily obtained, easily preserved without undergoing deterioration, which answers every purpose required in medicine, and which can be used without the inconvenience attending the use of the other. The nitric acid of 1851 is admitted on all hands to be the most stable of the hydrates of nitric acid. It is easily produced as a colourless acid, which retains this condition when exposed to the light. It may even be distilled without change, which cannot be said of nitric acid in any other state of hydration. What better acid could be selected for use in medicine? Yet we are now carried back again to the stronger acid of 1836. The nitric acid of the British Pharmacopœia is an acid having the specific gravity of 1·5. It is not a commercial acid, but has to be made specially for our use. It is not obtained in a colourless condition; and although it may be rendered colourless by a troublesome and somewhat difficult process, it cannot be kept in that state, for it is constantly undergoing decomposition under the influence of light, and the result of this decomposition is that it loses strength, and becomes more and more contaminated with the red nitrous gases which are generated. The introduction of this strong fuming nitric acid again into the Pharmacopœia is certainly a retrograde movement. There is no purpose to which nitric acid is directed in the Pharmacopœia to be applied where the acid of the last Pharmacopœia would not answer as well as or better than this.

Acidum sulphuricum is described in the Materia Medica part of the work as monohydrated sulphuric acid, for which a chemical formula (HO, SO_3) is given in accordance with that name. But what, it may be asked by some of our brethren who have not just issued from the chemical laboratory of this or some other institution,—what does monohydrated sulphuric acid mean, and what is the body represented by that chemical formula? Does it mean oil of vitriol? because if it does, we know what that is. Well, it must be admitted that it does not mean oil of vitriol, for oil of vitriol is commercial sulphuric acid, and this is something different from that. Then if the "sulphuric acid" of the British Pharmacopœia is not oil of vitriol, and is not a commercial article, which it is not, how is it to be obtained? The Pharmacopœia tells us how to obtain it, for it gives a process for the purpose. This consists in distilling oil of vitriol with sulphate of ammonia, fractionizing the products of distillation, rejecting the first product, and saving the second, which is the acid in question. Now all this presents a greater amount of difficulty than might appear at first sight. To carry the process out as directed is no easy matter. To begin at the beginning, we are told that the oil of vitriol to be thus treated, must give no evidence of the presence of arsenic by that most delicate of tests called Marsh's test; and it is doubtful if any oil of vitriol can be met with in this country that will stand this

test. Then, if we succeed in finding suitable oil of vitriol for the purpose, the distillation of the acid in glass retorts is a most difficult operation. The difficulty of concentrating oil of vitriol in glass was found to be so great, that manufacturers gave it up, and took to the use of platinum stills at an enormous cost. Yet in that process the water is distilled away from the acid, while the concentrated acid is left in the still. But in the Pharmacopœia process we are directed to distil the acid itself. The apparatus for the purpose is before you, although I do not recommend you to undertake the operation. Manufacturers will, no doubt, be induced to do it at a price; but then the question will very naturally be asked, Is the improvement in the product worth the cost of its production? By simple distillation the acid is deprived of a little sulphate of lead, which the commercial oil of vitriol contains, and which would be precipitated by merely diluting it with water, and by distilling it with sulphate of ammonia it is freed from any nitric or nitrous acids it may contain. Something more than this, however, appears to have been contemplated in the process, for the product is described as monohydrated sulphuric acid. Now will it realize this description when obtained by the process given? I venture to say that it will not. It will not be monohydrated sulphuric acid, and this is perhaps a fortunate circumstance, for monohydrated sulphuric acid would not be well suited for use in pharmacy. It is an acid which congeals in cold weather, as glacial acetic acid does, and the use of such an acid would be attended with much inconvenience. We are afforded a means of escape from this dilemma, it is true; for after stating that the sulphuric acid to be used in medicine is to be the monohydrated acid, the description goes on to say that it is to have a specific gravity of 1·846. Now this is the specific gravity of an acid weaker than the monohydrated acid. Still the specific gravity given is greater than it will be found easy to obtain, and the question again arises, Why should we be required to use a stronger acid than the acid of commerce, which is strong enough for any purpose to which it is applied in medicine?

Time will not admit of my entering further into the subject of the acids, and I therefore turn now to the alkalies.

Liquor ammoniæ and *liquor ammoniæ fortior* are but little changed, yet they are not exactly as they were. The difference is so small that one wonders why there should be any difference. The specific gravities of the old and new solutions are as follows:—

	Ph. Lond.		Ph. Brit.
Liquor ammoniæ	0·960	...	0·959
Liquor ammoniæ fortior	0·882	...	0·891

Liquor potassæ and *liquor sodæ* are both rather weaker than they were. In liquor potassæ the difference is so small that it is hardly worth notice, but in liquor sodæ there is a greater difference. The specific gravities of the old and new solutions are as follows:—

	Ph. Lond.		Ph. Brit.
Liquor potassæ	1·063	...	1·058
Liquor sodæ	1·061	...	1·047

The two solutions, according to the London process, were made to nearly coincide in density; whereas according to the new process they differ in density, but nearly coincide in neutralizing power.

Potassæ carbonas must be described as one of the new preparations of the British Pharmacopœia. Hitherto the term "carbonate of potash" has been applied in our Pharmacopœia to that very well known commercial article commonly called "salt of tartar," for the preparation of which a process was given in the London Pharmacopœia of 1836. The process then given, and which is practically adopted on the large scale, consists in purifying

commercial potash or pearlash by treating it with a small quantity of cold water, which dissolves the carbonate of potash and chloride of potassium, and leaves the greater part of the sulphate of potash which commercial potashes always contain. The solution thus formed is afterwards evaporated until the salt, while constantly stirred, becomes dry in the pan. It constitutes, as is well known, a dry granular salt, which, if exposed for any length of time to the air, attracts water, and becomes first moist and afterwards liquid. If it be well dried in its preparation, and if it be carefully excluded from the atmosphere, it can be kept and used without any great difficulty; and although it is not absolutely pure, it answers every purpose required in medicine.

Besides this so-called salt of tartar, there is a pure carbonate of potash, which used to be, and still might be more correctly, called salt of tartar, because it is made from cream of tartar, or from bicarbonate of potash, by the application of heat; and this is usually kept in the anhydrous state for the delicate purposes of chemical analysis.

Now, the carbonate of potash of the British Pharmacopœia is neither the salt of tartar of commerce nor the pure carbonate of potash of analytical chemists, nor any other form of carbonate of potash to be found anywhere else than in chemical books. This new carbonate of potash is represented in the description given of it as containing two atoms of water. This is indicated by the chemical formula ($KO, CO_2, 2HO$); and it is further indicated by the quantity of water it is said to lose on the application of heat—namely twenty-one per cent., and by its neutralizing power when treated with the volumetric solution of oxalic acid. Salt of tartar, on the other hand, contains only about an atom and a half of water, which is equal to 16 per cent., instead of 21 per cent. The difference then is, that the Pharmacopœia salt contains half an atom of water more than is present in the salt of commerce. You may think this a very trifling difference; but in effect it is an important difference. It just constitutes the difference between a convenient and a most inconvenient product. It represents also the difference between the composition of crystallized carbonate of potash, as given in chemical books, and that of the dry, although still hydrated, carbonate as obtained by a practical operation, and in a state in which it is fit for use. The books are right in representing crystallized carbonate of potash as it is represented in the British Pharmacopœia; but to obtain the salt in that state involves considerable difficulty. It can, however, be obtained in fine large, transparent prisms, which are so deliquescent that it is as difficult to keep as it is to obtain them.

For *potassæ bicarbonas* and *sodæ bicarbonas*, processes are given which, if it were desirable to make these preparations on a small scale, are quite unexceptionable. The processes are in operation before you, and the apparatus used is similar to that described in the Edinburgh and also in the Dublin Pharmacopœias; in fact, the process appears to be almost literally that of the Dublin College as given in their Pharmacopœia of 1850.

Magnesia and *magnesiæ carbonas* are changed from light to heavy, and processes are given which are perfectly efficient for the production of these varieties of magnesia.

It is important to observe that, in future, when *magnesia* or *carbonate of magnesia* is ordered, the heavy variety is to be used; not the comparatively heavy, but the heaviest of the sort.

Metallic preparations.—Amongst the metallic preparations we have a very good process for emetic tartar, now called

Antimonium tartaratum, which consists in mixing oxide of antimony and cream of tartar into a paste with water, and allowing the mixture to stand for twenty-four hours; then adding more water, boiling for a quarter of an hour, filtering the solution, and setting it to crystallize.

This method of effecting the combination of weak vegetable acids or acid salts with metallic oxides might have been followed with advantage in other cases, where much less efficient methods have been adopted. Thus, for instance, potassio-tartrate of iron, which is now called—

Ferrum tartaratum, is directed to be made by heating the cream of tartar and oxide of iron in the presence of a large quantity of water, which is unfavourable to the combination of the metallic oxide with the acid salt. The process given for this preparation is also defective in ordering the solution in its very dilute state, as first produced, to be poured on to porcelain or glass plates, to be dried in scales. This mode of operating would be practically impossible.

Ferri et ammoniæ citras.—The process for this preparation is subject to the same objections that attach to the preceding. There is too much water present when the combination is effected, and the solution, if formed as directed, would be in too dilute a state to be spread on glass or porcelain for scaling.

Ferri et quiniæ citras.—I have not yet fairly tried this process, but I do not think it will yield the pretty salt which has become so firmly established in medical practice.

I must now say a few words with reference to a preparation about which there has been a good deal of discussion lately in the Medical and Pharmaceutical Journals. I allude to the popular medicine called "Sweet Spirit of Nitre." There are great differences in the strength and quality of this medicine as met with in various pharmaceutical establishments, and some discredit has been thrown upon those who make it, and sell it, on account of this difference in quality. But I think it has pretty clearly appeared from the discussion of the subject, that the process given in the Pharmacopœia has been as much at fault as those who have had to apply the process. *Spiritus Ætheris Nitrici*, made according to the process of the London Pharmacopœia, might contain any quantity from a mere trace up to probably seven or eight per cent. of nitrous ether, according to the quantity of the ingredients operated upon in the process, the form of the apparatus, and the temperature applied in effecting the distillation. We have all been agreed and have long been aware that the process of the London Pharmacopœia was liable to yield very variable results according to the mode of applying it, yet under the most favourable circumstances it has yielded a sweet spirit of nitre which the public, who are great consumers of it, have generally approved of. We have been fully aware of the defects in the processes hitherto used, and were given to understand that the British Pharmacopœia would supply us with a new and greatly improved process. This new process is now before us. It consists in distilling a mixture of spirit of wine and oil of vitriol with nitrite of soda. The process, I have no doubt, would be a very good one if we had the means of carrying it out as intended; but we are met at once with a difficulty, which is that nitrite of soda is not a commercial article. This difficulty, however, is met in the Pharmacopœia by a process being supplied for the preparation of nitrite of soda. Unfortunately the process given for the preparation of nitrite of soda does not yield the product we require. I have tried the process myself, and have obtained samples of the so-called nitrite of soda made by the Pharmacopœia process from several manufacturing chemists of the highest reputation, and in every instance I have found it to consist principally of nitrate of soda, with a good deal of carbonate and a very little nitrite. It is a mistake to call this salt nitrite of soda, or to expect that the process given will yield a product having the composition represented by the formula (NaO, NO_3), which is the formula given in the Pharmacopœia. The nitrite of soda produced by the process of the British Pharmacopœia will be a variable product, and the sweet spirit of nitre produced from it is not likely therefore to be uniform in composition or quality. This process for making *Spiritus Ætheris Nitrosi* is in operation before you, and you will have an opportunity of examining the pro-

duct, as well as that obtained by other operators. I have compared it with the preparation made by the London Pharmacopœia, and I certainly prefer the latter, as a more agreeable spirit, to which the name "sweet spirit of nitre" more fully applies.

Collodium.—Among the new preparations introduced into the British Pharmacopœia is Collodium, for the preparation of which a process is given, but of this I cannot speak more favourably than of that just noticed. The success in making collodion depends upon the quality of the pyroxylin employed for the purpose. The Pharmacopœia gives a process for making the pyroxylin to be used in the production of the collodion, but on trying the process I have obtained an insoluble, and not a soluble cotton. Such a result was just what I should have anticipated; for in the process given the strongest nitric and sulphuric acids are directed to be used, which would yield very good gun-cotton, if required as an explosive agent, but it is well known that good gun-cotton is not soluble in the mixture of ether and alcohol, and that to obtain a cotton that is soluble, and suitable for making collodion, the acids should be mixed with a portion of water, and should be used at a certain fixed temperature, with reference to which no instructions are given in the Pharmacopœia.

One other preparation I have yet to refer to, and that is *Distilled Water.* The description given of the distilled water directed to be used in pharmacy, affords a good illustration of what appears to me to be a defect in many parts of the work; and that is an attempt at too great refinement. We are told that distilled water should answer to the following character, among others, namely, "that a fluid ounce of it evaporated in a clean glass capsule leaves no visible residue." Now, I should like to see such distilled water made by simple distillation with a copper still, as described in the Pharmacopœia. In the instruction of pharmaceutical pupils I have been accustomed to set them the task of producing such distilled water, as one which they would think very easy, but which experience proves to be attended with considerable difficulty.

ON THE ORGANIC MATERIA MEDICA OF THE BRITISH PHARMACOPŒIA.

Lecture I.

Delivered at the Pharmaceutical Society of Great Britain, on the 24th of February, 1864.

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The recent publication of a Pharmacopœia which an Act of Parliament declares shall alone be used in the British Islands, cannot but be a source of gratification to all classes in the kingdom, and an event in which Medical Practitioners and Pharmaceutists especially must feel the greatest interest. There is no subject, therefore, that is so well adapted at the present time for bringing before the Members, Associates, and Pupils of the Pharmaceutical Society, in a course of lectures, as a general account of the history, construction, nature of the changes, and description of the new remedies of the first British Pharmacopœia. When we consider the great difficulties that the framers of this national work have had to encounter, I feel sure you will all agree with me, that whatever errors it may contain and whatever its shortcomings may be, we should make all reasonable allowance for them, and approach its consideration and critical examination in a philosophic and kindly spirit, and with an anxious desire of finding out its merits rather than its defects. At the same time, it is imperatively necessary

that a work of so much importance, one of constant reference and study, and one upon the right interpretation of which will frequently depend the issues of life or death, should be thoroughly and critically examined,—not only for the purpose of preventing any present inconvenience and danger, but also as a guide to the framers of subsequent editions. If we can ever hope to see an approach to a perfect pharmacopœia, it is incumbent upon us, and all branches of the medical profession, to do all we can in our several positions to assist in the consummation of so desirable an end. With an earnest desire to have explained and made easy to you the interpretation of a national work, and with the hope of doing something at least to its future improvement and development, the Council of this Society have requested their Professors, in their several departments, to deliver a series of lectures upon those parts of the British Pharmacopœia which have an especial bearing upon their respective duties. Upon my colleague, Dr. Redwood, to whose province the details of the Pharmacopœia especially belong, the more important portion of the labour will devolve, as he will have to bring before you the part which treats of the preparations and compounds. My duty will be to describe the Materia Medica, at least, that portion which refers to Organic Bodies; and although I do not claim for this department so prominent a position as that coming under Dr. Redwood's notice, yet I do claim for it your most careful and earnest consideration, for I need scarcely remind you, that unless you are able to recognise the various drugs ordered to be used in the British Pharmacopœia, and to judge of their purity or otherwise, however perfect your knowledge may be of the preparations and compounds, you will not be in a position to apply such knowledge with any certainty of success. A thorough acquaintance with the articles of the materia medica should be, therefore, your first chief consideration; and it is with the hope of being instrumental in assisting you in its study that I shall in this and a succeeding lecture review, as far as time will allow me, the more important changes which the organic materia medica of the present Pharmacopœia has undergone when compared with the last published editions of the Pharmacopœias of the United Kingdom, and also explain briefly the essential characteristics of those substances which may appear to me to require them, more especially those which are for the first time to be found in a British Pharmacopœia, or which are new to the limits formerly comprised by the London Pharmacopœia.

In the preface of the British Pharmacopœia we read that, "the materia medica contains, in its simplest pharmaceutic form, every definite medicinal substance, whether obtainable in ordinary trade or prepared by the chemical processes in the second part, which the committee of the Council found, on careful inquiry, to be so far approved in practice as to be entitled to a place in a National Pharmacopœia. Under each article are given:—1. A Latin Pharmaceutic name, by which it may be prescribed; and an English name, for use in describing the processes in the second part; 2. Its definition, together with its chemical symbol if it be a substance of definite composition, its botanical name if it be a plant, or its botanical source if procured from a plant; and also, in most cases, a reference to a correct figure of the plant, and a statement of the quarter whence the article is obtained; 3. The characters by which it may be distinguished from all other articles of the materia medica; 4. The tests by which it may be ascertained to be of due strength, and free from known impurities or adulterations; and 5. The preparations of which it is an active ingredient."

It is remarkable that no allusion is here made to the mode pursued in treating of the articles of the materia medica which are derived from the animal kingdom. It is just possible that this omission may have been an intentional one, from the small number of animal substances which are ordered to be used in the Pharmacopœia. We think, however, it is desirable for you to know, that animals and animal products are treated of in an analogous manner to plants and vegetable products.

The above extract from the preface will show that the materia medica of the British Pharmacopœia forms a very important portion of that volume. Altogether it is comprised in *one hundred and fifty-seven* pages, or in but *seventy-seven* pages less than the part treating of the preparations and compounds. This is, at least, three times the space which has hitherto been devoted to the materia medica in any British Pharmacopœia. The object of this more detailed account has evidently been to provide an epitome of the subject, which should comprise everything that was most essential to be known, as well as to form a foundation for future studies. The increased importance given to the materia medica in the present Pharmacopœia we regard as a great improvement and material advance over the plan pursued in preceding Pharmacopœias, and one which we feel sure will be duly appreciated.

Although thus cordially welcoming this improvement in the materia medica, there is, we think, one great omission which will mar its usefulness, that is, the complete absence of any reference to the doses of the crude drugs and their different preparations. Some account of the doses of the various substances was more especially called for in a work which introduces to our notice many new, and, in some cases, but comparatively little known and powerful drugs, and in which numerous old and familiar preparations have been altered materially in strength. We trust to see this omission rectified in a future issue, so that the Pharmacopœia may contain in itself all that prescribers and dispensers are absolutely required to know. We should also like to see more care taken in succeeding editions in enumerating the different preparations of each article of the materia medica, for in the present Pharmacopœia there are many important ones omitted. It should be especially noticed, however, that those preparations *only* were intended to be enumerated, in which each article of the materia medica enters as an *active* ingredient.

There is one result which I cannot forbear alluding to, and which will, I fear, to some extent be brought about by this enlargement of the materia medica, and that is, its use by students as a *multum in parvo*, a kind of "cram." I sincerely hope that such may not be the case, for if so, it will be a great evil; for important and useful as the short notices of the materia medica are, they can only serve as a foundation for further studies, or, as an abstract of what is essential for future use. He would, indeed, possess but a superficial knowledge who would refuse to proceed further than the Pharmacopœia taught him of materia medica, and, to such a student, a large amount of most important and interesting matter would be entirely unknown.

In the February number of the Pharmaceutical Journal, in an article entitled, "Explanatory and Critical Notes on the British Pharmacopœia," I have given several tables, for the purpose of showing the great changes which the organic materia medica of the British Pharmacopœia presents when compared with that of the last editions of the London, Edinburgh, and Dublin Pharmacopœias. From these tables it appears that no less than *eighty-two* organic substances formerly included in the British Pharmacopœias, and *fifty-two* plants and animals, have been altogether excluded from the present British Pharmacopœia. Of these excluded substances, *sixty-six* were formerly officinal in the Edinburgh Pharmacopœia, *forty-three* in the London, and *thirty-three* in the Dublin; hence, in this respect, the British Pharmacopœia presents fewer changes from the Dublin than from the London and Edinburgh. The great majority of organic substances excluded from the Edinburgh Pharmacopœia is doubtless due to the long period which has elapsed since a new Pharmacopœia was issued by the Edinburgh College of Physicians.

Other tables have been given in the same article, which show that but *twenty-three* new organic substances have been introduced into the materia medica and appendices of the British Pharmacopœia.

Having now given a summary of the changes in the present British Pharmacopœia as compared with the last editions of the London, Edinburgh, and Dublin Pharmacopœias, we proceed to notice the British Pharmacopœia with reference more especially to the last London Pharmacopœia. We commence by calling your attention to the following—

Table of Organic Substances which were officinal in the last London Pharmacopœia, but which are excluded from the British Pharmacopœia.

Absinthium.	Morphiæ Acetas.
Acetum (Britannicum).	Mucuna.
Aloe hepatica.	Oleum Fœniculi.
Althæa.	Ovi Vitellus.
Amygdala amara.	Petroleum.
Anisum.	Piper longum.
Avena.	Pix.
Canella.	Pulegium.
Carota (Radix).	Pulegii Oleum.
Chimaphila.	Pyrethrum.
Cornu.	Rhamni Succus.
Cydonium.	Ruta.
Cyminum.	Sago.
Granatum (Rind of Fruit).	Sagapenum.
Helleborus.	Spiritus Vini Gallici.
Inula.	Staphysagria.
Juniperus (Fructus).	Terebinthina Chia.
Lactuca sativa.	Terebinthina vulgaris.
Laurus.	Tormentilla.
Maranta.	Veratrum.
Mentha piperita (Herba).	Viola.
Mentha viridis (Herba).	

A list which thus includes *forty-three* organic bodies formerly contained in the London Pharmacopœia, will show that the framers of the British Pharmacopœia have been anything but sparing in their condemnation of remedial substances derived from plants and animals. By referring to the list, I think you will agree with me that, upon the whole, the exclusion of such bodies was a step in the right direction, for articles as Carotæ Radix, Cornu, Cydonium, Cyminum, Inula, Laurus, Mucuna, Spiritus Vini Gallici, Staphysagria, Terebinthina Chia, Viola, and others, can have no claims to be inserted in a national Pharmacopœia. Some other excluded substances, however, as Althæa, Canella, Chimaphila, Helleborus, Lactuca, Maranta, Morphiæ Acetas, Pyrethrum, Sago, and Tormentilla, have, we think, at least equal claims for insertion as Armoracia, Dulcamara, Elemi, Ficus, Mori Succus, Prunum, Pterocarpus, Rhœas, Rosa canina, and Ulmus, which are retained in the present British Pharmacopœia. The authors of the Pharmacopœia appear to have had an especial regard for flavouring and colouring agents, in which we are not prepared to say they were altogether wrong, for we all know the influence which the palate and imagination have frequently upon patients.

In other cases, we should have recommended the further use of the pruning-knife; thus, what material advantage has been gained by retaining all the following fruits, possessing as they do nearly identical properties, namely, Anethum, Carui, Coriandrum, and Fœniculum; or, in like manner, Oleum Anethi, Oleum Anisi, Oleum Carui, and Oleum Coriandri; or, all the following balsamic substances,—Benzoinum, Styrax, Balsamum Peruvianum, and Balsamum Tolutanum; or all the following astringents,—Catechu nigrum, Catechu pallidum, Kino, and Krameria? What particular virtues *Oleum Coriandri* possesses over some other oils belonging to the same Natural Order as the plant

from which it is derived, we are unable to imagine; but as it is an entirely new substance in a British Pharmacopœia, we have no reason to doubt that its claims for such an especial recognition were very strong in the opinion of the Medical Committee of the Pharmacopœia.

If we now turn from the consideration of the excluded organic bodies to those which have been newly introduced, we find that, although there are but *twenty-three* entirely new to the Pharmacopœias of the United Kingdom,* yet, when compared with the last London Pharmacopœia, the number of new bodies is increased to *forty-three*, as may be seen by the following table:—

Table of New Organic Substances in the British Pharmacopœia as compared with the last London Pharmacopœia.

Acidum Aceticum Glaciale.
*Aconitia.
*Aconitum (Flowering Tops).
*Arnica.
*Beberiæ Sulphas.
*Bela, or Bael.
Belladonnæ Radix.
Cannabis Indica.
Chirata.
Cocculus.
*Collodium.
*Conii Fructus.
Cotton.
*Cusso, or Kusso.
*Digitalinum.
Filix.
*Fel Bovinum.
*Fel Bovinum Purificatum.
Fousel or Fusel Oil, or Amylic Alcohol.
Glycerinum.
Hemidesmus.
*Indigo.
Jalapæ Resina.
*Kamela.
Laurocerasus.
Lini Farina.
Matico.
*Nectandra.
Oleum Myristicæ.
——— Cubebæ.
*——— Coriandri.
*Oxalic Acid.
*Podophylli Resina.
*Podophyllum peltatum.
*Pyroxylin.
Sabadilla.
Saccharum Lactis.
*Santonica.
*Santoninum.
*Scammoniæ Radix.
*Scammoniæ Resina.
Spiritus Pyroxylicus Rectificatus.
Terebinthina Canadensis.

The number of new organic substances introduced into the British Pharmacopœia as compared with the last London Pharmacopœia, and the number excluded, may thus be seen to be precisely equal. We feel that some other organic substances in great demand in certain parts of the country might, with advantage, have been also introduced; as Physostigma venenosum, the plant from which the Calabar Bean, now completely established as a most valuable remedial agent, is derived, Actæa racemosa, Prunus Virginiana, Veratrum viride, Pepsine, etc.; at all events, these have at least equal claims for insertion as Sulphate of Beberia, Nectandra, Arnica, Oleum Coriandri, and Fel Bovinum. We should like to see a similar plan adopted by the framers of the British Pharmacopœia as has been for a long period employed with great advantage in the United States Pharmacopœia,—that is, to have a Secondary List of the Materia Medica, in which should be inserted substances possessing no very evident medicinal properties, and which do not enter into any of the preparations and compounds; as also those of recent introduction which are upon their trial, but not sufficiently established to warrant their being placed in a prominent position in a national Pharmacopœia. In such a list, articles as Actæa racemosa, Prunus Virginiana, Pepsine, Sulphate of Beberia, Cocculus, Cusso, Hemidesmus, Kamela, Chirata, Terebinthina Canadensis, Veratrum viride, Tormentilla, and very many others might be placed. We feel sure that a list of this kind would

* These are marked with an asterisk in the Table of New Organic Substances.

be of great advantage, and we hope to see the plan acted upon in the next edition of the British Pharmacopœia.

Having now given a general sketch of the design, object, arrangement, and changes which have taken place in the organic Materia Medica of the British Pharmacopœia, as compared with the last published Pharmacopœias of the United Kingdom, together with some suggestions for further alteration and, as we believe, improvement, we proceed to make a few remarks upon those articles of the Materia Medica which appear to require them, and more especially of those that are altogether new, or which are new, at least, to an English Pharmacopœia. The first substance we notice is also that which comes first in the alphabetical arrangement of the Materia Medica, namely,—

ACACIA.—The test of gum arabic in powder is given as follows in the British Pharmacopœia :—"The powder does not become blue on the addition of solution of iodine." This test, which is introduced for the purpose of detecting the adulteration of powdered gum-arabic with flour or starch, would be useless as ordinarily applied, as a solution of iodine will not then act upon starch unless its granules have been previously broken up by heat. The following test should be inserted instead :—A decoction of the powder when cold, or the mucilage made with boiling water when cold, does not become blue on the addition of a solution of iodine.

It is indeed true that *impure dextrin*, and a few commercial starches which have been previously submitted to heat, might, if certain precautions be taken, be detected by the Pharmacopœia test, but as such are scarcely likely to be employed for adulterating gum arabic in powder, or if so used, might be more readily detected by the test we have given, that test is still seen to be the preferable one.

ACONITI RADIX.—The characters given of this root are :—"From one to three inches long, not thicker than the finger at the crown," etc. It would have been better to have said,—*usually* from one to three inches in length, and *but seldom* thicker than the *middle* finger at the crown ; for the root is not unfrequently seen (as the specimens on the table show) four inches or more in length, and of greater thickness than that indicated in the Pharmacopœia. The term "finger" is also indefinite ; does it mean middle, ring, index, or little finger?

One of the preparations which is ordered of aconite root, namely, the tincture, is said to be "*half* the strength of Tinctura Aconiti, *Dub.;* and *one-third* the strength of Tinctura Aconiti, *Lond.*" This is an important error, for it is only *one-fourth* the strength of the former, and *about one-third* that of the latter.

ACONITIA.—This alkaloid was formerly officinal in the London Pharmacopœia of 1836, under the name of Aconitina, but was omitted in that issued in 1851. We are glad to see it restored to the Pharmacopœia, as we know from personal experience, and otherwise, that it has been much employed, and is a most valuable external application in neuralgic and rheumatic affections, etc.

The following is given as the test of *Aconitia:*—"Dissolves entirely in pure ether ; leaves no residue when burned with free access of air." Upon turning to "Atropia," the alkaloid directed to be obtained from belladonna root, it will be found that the same test is given of that alkaloid ; hence it is clear that the so-called test simply contains certain characteristics common to both alkaloids, and, therefore, is not a test of either.

ACONITUM.—"The fresh leaves and flowering-tops ; gathered, when about one-third of the flowers are expanded, from plants cultivated in Britain," are directed to be used. The employment of flowering-tops is entirely new to British Pharmacopœias, and we doubt the propriety of ordering them. The botanical characters which are given of both the leaves and flowers are not sufficiently precise, and would apply equally to those of other common species of Aconitum. As distinctive characters, therefore, they are valueless.

It should be especially noticed that the leaves and flowering-tops are directed to be gathered when about *one-third of the flowers are expanded.* We are very glad to find that the directions given in the British Pharmacopœia as to the time of gathering the leaves, etc., of Aconite, Belladonna, Conium, Hyoscyamus, and other herbaceous plants are very explicit, as in previous Pharmacopœias no precise information upon that point has been given. The opinion commonly entertained by vegetable physiologists until lately, was—that the best time for taking the herbaceous parts of plants for use in medicine, as a general rule, was just at the commencement of the flowering stage; and the reason adduced for the selection of that period was because the process of flowering, and more especially that of fruiting, required a great supply of nourishment, and hence, as a necessary consequence, a corresponding weakening of the vital activity of the plant was produced.

In a paper read before the Pharmaceutical Society "On Expressed Juices" by Mr. Squire, in August, 1841, and which was published in the first volume of the Pharmaceutical Journal,* he states, "I am persuaded that the juice is in the greatest perfection in the plant when *more than half the flowers are fully blown.*" This was, I believe, the first time that public attention was especially called to the subject; and although I do not agree with the statement of Mr. Squire, that a general rule can be laid down which shall be applicable to the time of collecting all medicinal herbaceous plants, yet I do agree that the best time for collecting the herbaceous parts of plants is after the period of flowering has commenced; that period, however, must vary to some extent, in different plants. I think that the authors of the Pharmacopœia have generally mentioned the best period for collecting medicinal herbaceous plants, and this is one of the points connected with the preparation of the Pharmacopœia in which the opinions of practical pharmaceutists have been found of especial value.

In a lecture which I delivered in this Institution, "On Plants in a State of Life," more than two years since, and which was afterwards published in the Pharmaceutical Journal, I endeavoured to explain why the herbaceous parts of plants should be taken after the flowering stage had commenced, as follows:—"There are two series of compounds formed by the action of light and air in plants, those of one series having for their object the nutrition of the plants in which they are formed, and being directly concerned in their growth and development,—and those of the other series called secretions, playing no active part in the plant after their perfect formation, the latter (*secretions*) being also commonly formed later in the life of the plant. . . . In the process of flowering, the only compounds that are taken up in any amount are those which are concerned in the growth and development of new tissues; no further growth can therefore take place, to any great extent at least, in the vegetative organs of the plant; but the secretions, by the removal of these products, become more concentrated, and the organs in which they are produced, by being left for a longer period in connection with the plant, have time to elaborate them more perfectly."†

Armoracia.—*Fresh* Horseradish root is directed to be employed in the only preparation in which it is ordered, namely, the Spiritus Armoraciæ Compositus. As the root, according to our experience, varies much in its pungent odour and taste at different seasons of the year, being much weaker in the summer months than in the early spring or late autumn, it would have been advisable to have directed the Compound Spirit of Horseradish to be prepared at the latter seasons. Had the Infusum Armoraciæ compositum of the London Pharmacopœia been retained, the root must have necessarily been obtained at the time in which such infusion was ordered; but it is not so with the compound spirit. The fact of

* Pharm. Journ., vol. i. p. 96. † Pharm. Journ., vol. iii. 2nd ser. p. 475.

horseradish root varying in strength at different seasons of the year is, of itself, a sufficient reason for not retaining the infusion in the Pharmacopœia.

ARNICA.—As this article is entirely new to the Pharmacopœias of the United Kingdom, although well known and much employed in Prussia and some other parts of Germany, in Italy, and in the States of North America, it will be necessary for me to make a few remarks on its botanical and geographical sources, its characteristics, and reputed medicinal properties. Arnica *root* is directed to be employed in the British Pharmacopœia; but on the Continent and in America the *flowers* are preferred, and ordered in all but one of the preparations which are there officinal. We are ignorant of the reason why the root is ordered in the British Pharmacopœia. We should have preferred the flowers, because they would be more likely to be uniform in their properties from being gathered at a definite period; while the root, from being collected at different periods, will necessarily vary considerably in its strength. The plant from which this article of the Materia Medica is derived is the *Arnica montana*, Linn., and belongs to the Natural Order Compositæ. It is a native of the mountainous districts of Europe, and of certain parts of North America and Asia.

The so-called Arnica root is really the rhizome, to which numerous small rootlets are attached. The rhizome is more or less twisted, rough from the scars left by the leaves which it formerly bore, somewhat cylindrical in shape, from one to three inches in length, and two or three lines in thickness. From this numerous small rootlets arise of variable length, generally two or more inches, and about the thickness of a common knitting-needle. Both the rhizome and rootlets have a brownish colour externally. The odour is peculiar, feebly aromatic, and disagreeable; and the taste somewhat peppery, bitterish, and nauseous.

The root has been found to contain *volatile oil*, *acrid resin*, *extractive*, *gum*, and *woody fibre*. The extractive matter of Arnica flowers, which is doubtless similar to that of the root, is said to be identical with *cytisin*, a poisonous principle obtained from the seeds of the common laburnum-tree.* Mr. Bastick has also obtained from Arnica flowers a peculiar alkaloid, which he named *Arnicina*.† The properties of Arnica appear to depend essentially upon the acrid resin, although these are doubtless modified to some extent by the volatile oil and extractive.

Arnica is very highly valued as a remedial agent in certain parts of the Continent. It is regarded as a most useful stimulant in typhoid fevers, and in various debilitated conditions of the system; in paralysis, amaurosis, and other nervous affections, etc. The trials which have been made in this country of its remedial virtues do not in any material degree confirm the extravagant encomiums which have been passed upon it on the Continent. The dose of our officinal tincture is, from *two fluid drachms* to a *fluid ounce*, every three or four hours.

The tincture of Arnica flowers, and also that of the root, have been much employed as a domestic remedy in this country and elsewhere, as an external application in sprains, bruises, etc. The experiments of Dr. Garrod, however, lead to the conclusion that its efficacy is entirely due to the rectified spirit employed in its preparation, as he found that about the same remedial effects were produced upon certain bruised surfaces by the application of either simple rectified spirit or tincture of arnica. Altogether, so far as present experience leads us in this country, we have reason to believe that the virtues of Arnica, both as an external remedy and for internal administration, have been vastly overrated; and hence we do not regard this substance as by any means a valuable addition to the Materia Medica of the British Pharmacopœia.

BEBERIÆ SULPHAS.—NECTANDRA.—These articles are entirely new to a

* Medical Times and Gazette, Nov. 1856, p. 446. † Pharm. Journ., vol. x. p. 389.

British Pharmacopœia. Nectandra has also been introduced into the recently-issued United States Pharmacopœia. Sulphate of Beberia is the sulphate of the alkaloid *biberine*, or *bebeerine*, obtained from Bebeeru bark, which is imported from British Guiana. The plant from which this bark is derived is the *Nectandra Rodiæi* of Schomburgk, and commonly termed the Greenheart tree. It belongs to the Natural Order Lauraceæ.

The bark is in large, flat, heavy pieces, from one to two feet long, from two to six inches broad, and about a quarter of an inch thick. It is nearly smooth externally, and of a greyish-brown colour. Internally its colour is dark cinnamon-brown. It has no odour; but its taste is strongly and persistently bitter, combined with great astringency.

As far back as 1834 it was recommended as a substitute for cinchona by Dr. Rodie, who discovered an alkaloid both in it and the fruit. It attracted very little attention however till 1843, when Dr. Douglas Maclagan, of Edinburgh, published a number of observations confirming Dr. Rodie's discoveries, and highly recommending it for its antiperiodic properties. Other medical practitioners subsequently testified to its antiperiodic virtues, and it was thought by some that it would form a valuable substitute for cinchona bark. The more recent experiments of M. Becquerel in France with the sulphate of beberia, as well as those of Drs. Pepper and Dailey in North America, and recently of Dr. Garrod in this country, do not confirm the favourable results first obtained, but show that although occasionally successful, it cannot be relied on as a substitute for sulphate of quinia. With such testimony before us, we do not regard the introduction of sulphate of beberia into the British Pharmacopœia as a valuable one. The dose of the sulphate of beberia is from *one* to *three* grains as a tonic, and from *five* to *twenty grains* as a febrifuge.*

Bela, Bael.—This is an entirely new article in a British Pharmacopœia. The plant which yields it is the *Ægle Marmelos*, DC., belonging to the Natural Order Aurantiaceæ. The officinal part is the half-ripe fruit dried, which is obtained from the East Indies, and chiefly from Malabar and Coromandel. A full account of the plant and its reputed properties was published some years since in the Pharmaceutical Journal.† The recently issued United States Pharmacopœia takes no notice of Bael.

The officinal half-ripe fruit is about the size of Mogadore Colocynth fruit, or a small shaddock. It has a hard woody rind, about two lines thick, and of a greyish or reddish-brown colour. The dried pulp has a brownish-orange or orange-red colour, and contains numerous seeds; it has no odour, but a mucilaginous, slightly astringent taste. The fruit is but rarely imported entire, but generally in dried, more or less twisted slices; or in fragments consisting of pieces of the rind and adherent pulp and seeds.

This half-ripe fruit is regarded in India as a most valuable and efficacious remedy in dysentery, and all affections of the bowels accompanied by relaxation, and also in cases of irritation of the mucous membrane of the stomach and bowels. It is also said to relieve diarrhœa and dysentery without producing a subsequent constipation. The active or astringent principle is a kind of tannin. We have no very well recorded cases in this country of dysentery and diarrhœa in which Bael has been proved to be efficacious; and the experience of Dr. Garrod does not tend to show that it is at all preferable to other mild astringents in such diseases; hence, considering the number of astringents besides it in the British Pharmacopœia, we can find no satisfactory reason for its introduction.

Belladonna.—We notice this article of the Materia Medica because, for the first time in a British Pharmacopœia, the fresh branches together with the

* Pharm. Journ., vol. iii. p. 177; vol. iv. p. 281; vol. v. p. 228.
† Pharm. Journ., vol. x. p. 165.

leaves are ordered to be used in its officinal preparations. Similar parts are also directed to be employed of Conium and Hyoscyamus. Although the leaves of the above-mentioned herbaceous plants have been alone previously ordered in British Pharmacopœias, it has been long known by practical men that perfectly efficient and stable extracts, etc., could not be so prepared;* hence we are glad to find that the authors of the present Pharmacopœia have adopted the suggestion of Pharmaceutists.

In the lecture "On Plants in a State of Life," already alluded to, which I delivered in this Institution,† I made some remarks for the purpose of showing that the young herbaceous parts of plants did not materially vary in their activity from the leaves; and this was, I believe, the first time that their employment was endeavoured to be justified upon physiological principles. Thus, after showing the action of the leaves in the formation of the products and secretions of plants, I proceeded as follows:—"We have shown above, that without leaves or other organs of an analogous nature, no growth to any extent can take place, or any secretions be formed in the plant. Thus the floral leaves, and the green parts of the flower, have a similar effect to the leaves; even the young herbaceous parts, from which the leaves and other organs arise, are also directly concerned in the formation of products and secretions. This assimilating power of the young green herbaceous parts is commonly lost sight of, but in reality the structure of these parts is essentially the same as the leaves, except that their tissues are somewhat more compact and differently arranged; hence in proportion to amount of matter they do not expose so large a surface to the action of air and light as the leaves, and as the process of assimilation only takes place in the cells immediately below the epidermis, their powers of forming products and secretions is somewhat less intense, but the difference between the parts immediately in contact with the leaves and the leaves themselves must be very slight. Indeed I am by no means certain, but that the young herbaceous parts frequently contain quite as much, or even more active secretions than the leaves themselves; thus, if the latter organs be left on the stem till they have passed their active vital conditions, the active secretions which they normally contain will have passed to a great degree into the young stalks in their passage downwards to the main stem, and hence they would be then probably more active than the leaves, as they would in such a case not only be assimilating organs, but also the receptacle for the products and secretions formed in the surrounding parts. The most convincing proof that I can adduce of the capability of young succulent parts to form products and secretions, is in the case of Cacti, Euphorbias, etc., which have frequently no true leaves or other analogous organs, but the plants are formed of a succulent stem or stems, from which the flowers arise; nevertheless, as is well known, and in the case of some of the Euphorbias especially, the secretions produced are of a very active nature. I might pursue this subject further, but enough has been said to show that, in practice, in making preparations from herbaceous plants, (to which the above remarks are intended especially to apply), we may consider the young vitally active parts in immediate contact with the leaves, as not materially differing in activity from them, and that consequently they may be advantageously as well as economically used with them."

BELLADONNÆ RADIX.—Belladonna root was not mentioned in the last London and Edinburgh Pharmacopœias, but it was formerly officinal in that of the Dublin College. We remark upon it here because we find that the dried root imported from Germany is alone directed to be employed in the British Pharmacopœia. We regard this as a mistake, for, in the first place, we have no sufficient proof of the German root being more active than that of the wild

* See Papers by Mr. Squire in Pharm. Journ., vol. iii. 2nd ser. pp. 300 and 368.

† Lecture "On Plants in a State of Life," by Prof. Bentley, Pharm. Journ., vol. iii. 2nd ser. pp. 475 and 476.

or even cultivated plant of this country; secondly, from the roots of Germany being very liable to adulterations; and thirdly, because they will be there collected without any particular reference to the time of year, and hence will vary much in activity from that circumstance. Had English roots been ordered, there would have been far better opportunities of obtaining them genuine, and, as far as possible, of uniform strength?

BENZOINUM.—This is an old article of the British Pharmacopœias. It is stated in the British Pharmacopœia to be a resinous exudation from the stem, hence one would naturally conclude that it exuded spontaneously; but such is not the case, the resin only flowing out after the bark has been wounded.

BUCCO, BUCHU.—This has also for many years been included in our Pharmacopœias, but its botanical source is now properly given as *Barosma betulina*, *Barosma crenulata*, and *Barosma serratifolia*. It should be noticed, however, that *B. crenulata* is the *B. crenata* of Kunze, and Linn. sp. *B. betulina*, B. and W., is correctly stated in the British Pharmacopœia to be the *Diosma crenata*, Lodd. Cab.

CALUMBA.—This well-known article of the materia medica is stated to be derived from *Cocculus palmatus*, De Cand. The recent investigations of Mr. Miers show that De Candolle's plant is *not* our Calumba plant, which is the *Cocculus palmatus*, Wallich; the *Menispermum Calumba*, Roxb.; and the *Jateorhiza Calumba* of Miers. This is but a recent discovery, and hence the authors of the Pharmacopœia are not answerable for this error.* Amongst the characters of Calumba, it is stated to be *about two inches in diameter*. It is commonly less than this and sometimes more, in fact, it varies in diameter generally, from about an inch to three inches.

CAMPHORA.—This well-known substance is described "as a concrete volatile oil, obtained from the wood of *Camphora officinarum* by sublimation, and resublimed in bell-shaped masses; imported from China." The statement in the Pharmacopœia is incorrect, as crude camphor is alone imported, and is afterwards purified by resublimation in this country.

CARDAMOMUM.—The Malabar Cardamom obtained from the *Elettaria Cardamomum* is alone officinal, as in the last London Pharmacopœia. The Pharmacopœia directs for use "the seeds contained in their capsules, which are to be removed when the seeds are employed." This is not strictly correct, as a capsule is a kind of fruit of which the seeds form a necessary part; hence, in removing the capsules, we should take away the seeds also. No doubt this expression would be understood, and the seeds used as directed, but it would have been better to have said—the seeds contained in their coverings (pericarp), which are to be removed when the seeds are employed.

CATECHU.—Two kinds of catechu are officinal, as in the last London Pharmacopœia; one is called the Black Catechu, and is an extract of the heartwood of *Acacia Catechu;* and the other is termed Pale Catechu, and is an extract of the leaves and young shoots of *Uncaria Gambir*. Both sorts are directed to be employed indifferently in the Infusum, Pulvis Compositus, and Tinctura Catechu; and the pale catechu alone in the Trochisci Catechu. Surely this is a mistake, at least as regards the Infusum and Tinctura Catechu, for such preparations would vary much, and more especially in colour, according to the kind of catechu employed, and would thus frequently lead the patient to the belief of his medicines being wrongly prepared.

CHIRATA, CHIRETTA.—This was formerly officinal in the Edinburgh and Dublin Pharmacopœias, but not in that of the London College. The entire plant (*Ophelia Chirata*, DC.) is officinal in the British Pharmacopœia. It has been long employed in India, both by the native and European practitioners, and

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* Miers on the Menispermaceæ, Ann. and Mag. Nat. Hist., Feb. 1864.

is held in great esteem. In its operation, as well as by its botanical affinities, it is nearly allied to Gentian, and is reputed to be useful in the same diseases. As two plants of the same Natural Order are now excluded, namely *Erythræa Centaurium* and *Menyanthes trifoliata*, both of which were officinal in the last Edinburgh Pharmacopœia, and till recently also in the London and Dublin Pharmacopœias, we regard Chirata as a desirable substance to be introduced into the British Pharmacopœia. It has been also introduced into the new United States Pharmacopœia.

Cocculus, Cocculus Indicus.—This is the dried fruit of the *Anamirta Coçculus* of Wight and Arnott, a plant of the Natural Order Menispermaceæ. It is a native of the Malabar coast, and of the Eastern Archipelago. The fruit, now officinal in the British Pharmacopœia, was formerly so in the late Edinburgh Pharmacopœia, and till recently in the Dublin also, but it has never been included in the Materia Medica of the London Pharmacopœia. We regard its introduction into the British Pharmacopœia as a circumstance much to be regretted, for it is a powerful poison, and is possessed of no important remedial properties so far as we can ascertain. The ointment prepared from the seed is simply used for the destruction of vermin, and as a remedy in some cutaneous diseases, but if so employed when the skin is abraded it may, and has produced most serious consequences. Its introduction into the British Pharmacopœia is still further to be regretted, from the fact of its being employed, and, according to Pereira, extensively so, to give bitterness and intoxicating property to some malt liquors, although its use for such a purpose is forbidden in this country, and attempted to be restrained by heavy penalties. The fruit is described in the Pharmacopœia as *slightly ovate;* it would have been more distinctive to have said *somewhat kidney-shaped.*

Colchici Semen.—We notice this article of the Materia simply for the purpose of referring to the characters given in the British Pharmacopœia. Colchicum seeds are there described as "about the size of black mustard-seed, very hard, reddish-brown." This is not the first time that colchicum seeds have been stated to be about the size of black mustard seeds, for they are thus described by one of our most eminent writers on Materia Medica; but such a statement is quite incorrect, for they are always, at least twice, and frequently thrice as large, or even more. In size they more nearly approach white mustard seeds, although not generally quite so large as these; it is probable, however, that the error as to the size of colchicum seeds has thus arisen. The colour of colchicum seeds is also rather yellowish-brown than reddish-brown, and they are often quite brown, or even, in some cases, nearly black. So far as colour and size are concerned, they resemble Grains of Paradise more than black mustard seeds, and Pereira states that he has known colchicum seeds mistaken for Grains of Paradise.

Conii Fructus.—The fruit of the *Conium maculatum* is an entirely new article of a British Pharmacopœia. It is directed to be employed in the preparation of a Tinctura. The ripe fruit, dried, is alone officinal. In a recent lecture delivered at the Royal College of Physicians by Dr. Garrod, he thus speaks of the employment of the parts of *Conium maculatum* in medicine:—Hemlock owes its action to conia; all parts of the plant contain conia; and as it is easily decomposed, the Committee to whom was entrusted the preparation of the British Pharmacopœia had introduced the fruit, because the alkaloid was less liable to undergo decomposition in that part of the plant. The experiments of Dr. Garrod had also led him to believe that much larger doses of the tincture of conium could be borne than was generally believed; for he had found the dose of twenty minims of the London tincture useless, and had given from a drachm to half an ounce three times a day. He had a patient taking one ounce of the tincture made from the leaves, which had been most carefully collected and

dried, three times a day. He had afterwards given to the same patient five fluid drachms of the tincture made from the fruit according to the British Pharmacopœia. The tincture made from the fruit was undoubtedly stronger than that prepared from the leaves as formerly. The dose of the Tincture of Hemlock Fruit of the British Pharmacopœia is from *half a drachm* and upwards.

With this notice we conclude our lecture; and although in going through the several articles of the Organic Materia Medica we have thought it expedient and desirable to notice some errors and deficiencies, we wish it to be understood that, upon the whole, we regard this portion of the Pharmacopœias as well executed, and a great improvement over the corresponding portion of any previous Pharmacopœia published in the United Kingdom.

TO CORRESPONDENTS.

M. P. S. (Scarborough).—Those Chemists only whose names appear in the Register of the Pharmaceutical Society, are exempted from service on Juries.

A. L.—We believe the last edition of Beasley's 'Pocket Formulary' is the *seventh*, published in 1860 (Churchill).

H. B. N. (Newark).—*Solution of Valerianate of Ammonia.* There is no authorized formula; it is sometimes made to contain 25 per cent. of the salt. The following is Dr. Tanner's formula:—R. Ammon. Valer.: gr. i; Aquæ Destillatæ ʒi: solve.

C. A. Z.—There is no regulation that will prevent a candidate under the age of twenty-one years from offering himself on more than one occasion for the Junior Bell Scholarship.

An Apprentice (Hereford).—The Medical Council do not contemplate publishing an edition of the British Pharmacopœia, with the doses of the drugs and preparations.

A Student (Derby).—Fownes's 'Chemistry,' and Bentley's 'Manual of Botany.'

A Constant Reader (Lerwick).—Griffin's 'Chemical Recreations.'

Indigo.—Ure's 'Dictionary of Arts, Manufactures, etc.'

A. P. S. (Newcastle).—Messrs. Ladd and Oertling, 27, Moorgate Street.

"546" (Maldon).—The label in question is liable to the medicine stamp duty.

M. O. (Edinburgh).—*The Degree of Master of Science.* Apply by letter to Dr. Carpenter, Burlington House, Piccadilly.

"*A Chemist*" will see that the subject has received attention.

The Weights and Measures of the British Pharmacopœia.—A correspondent (Southport) suggests that "if the plain oz. and fl. drm. and fl. oz. be generally used, prescribers may expect disappointment in their anticipated beneficial effects of the medicines ordered, as many patients will probably dispense for themselves, and, as usual, procure the cheapest ingredients, regardless of the quality. So many Latin names being similar to the English, many persons can read a great portion of the prescriptions; but having some doubts about the quantities (through the symbols heretofore used), conclude it better to have them prepared by a Pharmaceutical or dispensing chemist."

The British Pharmacopœia.—The 32mo edition of the British Pharmacopœia is confidently expected to be published in a few days.

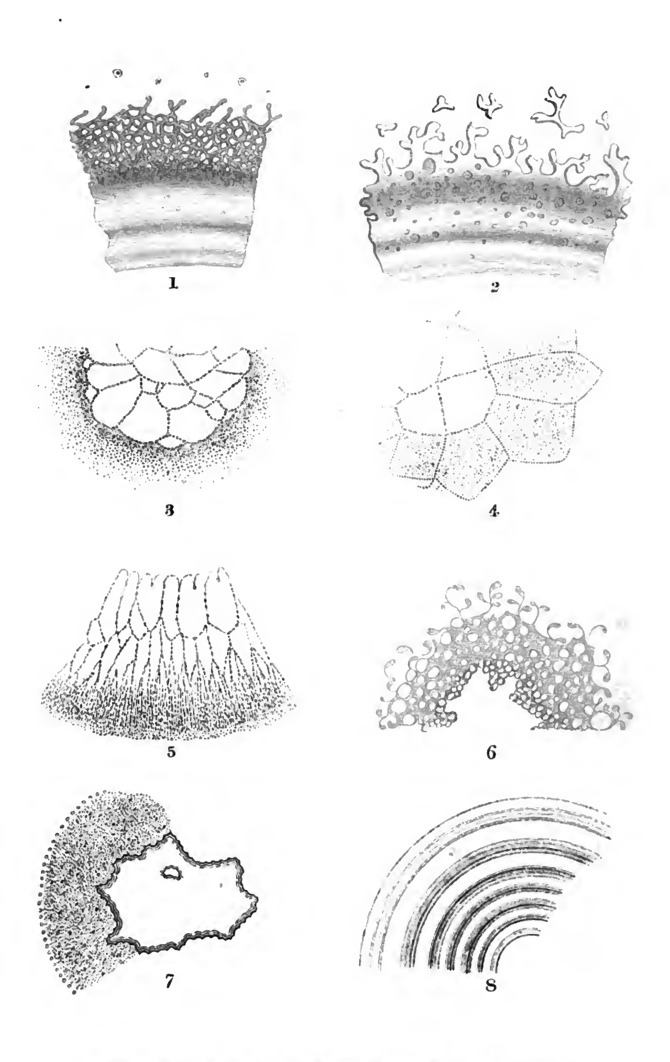
B. E. (Dover).—*Still Licence.* The licence empowers the person "not being a distiller, rectifier, or compounder of spirits, to keep or use a still for carrying on the trade or business of a chemist requiring the use of a still." The Act does not limit the number of stills or retorts to be used under one licence. The licence becomes due on the 5th of July. See Vol. III., Second Series, p. 202, were the subject is fully explained.

A. B. (Taunton).—In the case referred to we should consider the terms synonymous.

Wanted,—copies of the 'Pharmaceutical Journal' for May, June, July, and August, 1852; full publishing price will be given. Address, Mr. BREMRIDGE, 17, Bloomsbury Square.

Instructions from Members and Associates respecting the transmission of the Journal before the 25th of the month, to ELIAS BREMRIDGE, Secretary, 17, Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Messrs. CHURCHILL, New Burlington Street. Other communications to the Editors, 17, Bloomsbury Square.



EXAMPLES OF THE COHESION FIGURES OF LIQUIDS.

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. V.—No. X.—APRIL 1st, 1864.

MEDICAL AND PHARMACEUTICAL LEGISLATION.

In July of last year we announced the fact that a Committee of the General Council of Medical Education and Registration, to whom the consideration of the provisions of the Medical Act of 1858 had been submitted, had recommended that application should be made to Parliament for an amended Act, and that it was proposed in such new Act to include pharmacy among the departments of medical practice over which the Medical Council should exercise control.

The propositions which the committee submitted to the Medical Council were embodied in the draft of a Bill, and the provisions of this Bill, in as far as they related to pharmacy, comprised—

1. A general system of pharmaceutical education and examination, to be regulated by the Medical Council.
2. The registration of all persons qualified to practise pharmacy, as tested by such examinations.
3. The restriction of the right to dispense or compound the prescriptions of physicians or surgeons to qualified practitioners in pharmacy, and the imposition of a penalty upon those who shall keep open shop for compounding medicines without having passed the required examination.
4. The appointment by the Medical Council of inspectors, whose duty it should be to see that the provisions of the Act, affecting pharmacy, were duly carried into effect.
5. The prohibition of the sale of all secret remedies, and the imposition of a penalty for selling any patent or quack medicine, unless a sworn certificate of the composition of such medicine be exposed for inspection in the shop or place where it is sold.

The Medical Council expressed no opinion upon this or any other part of the proposed Bill, but submitted the propositions to all the medical licensing bodies throughout the country for their opinions upon them.

It was hardly to be supposed that the Pharmaceutical Society and the chemists and druggists not comprised in this Society, would remain indifferent or inactive observers of this movement with reference to legislation affecting pharmacy. This was not the first time that interference with the privileges and vested interests of chemists and druggists had been threatened under similar circumstances; and although in this instance there was probably no intention on the part of the framers of the Bill to deprive those already in business of the power of exercising their lawful occupations as they had been accustomed to do, yet as the terms of the draft Bill certainly went to that effect, it could not be wondered at that chemists and druggists throughout the country, seeing a proposition for an Act of Parliament that appeared to threaten them with ruin, should be alarmed and ready to take action in self-defence. The subject at any rate presented a sufficient plea for an appeal to the fears of those who fancied themselves assailed, and, at the same time, in favour of association for mutual protection. Meetings of the trade were held in different parts of the country, and at these the draft Bill, which the Medical

Council had never so much as discussed, was referred to as a matured measure having the sanction of the highest medical authority, and contemplating the disfranchisement of many thousands of chemists and druggists who have been engaged for years in the legitimate exercise of their business. It was in vain that we pointed to the crude nature of the measure under discussion, to the fact of its being only the outline of a Bill, to the improbability, nay, the impossibility, of any measure being carried through Parliament that proposed to deprive thousands of respectable tradesmen of the right to exercise the trade to which they had been educated, to which they had devoted the greater part of their lives, and in which was invested their only means of support. There, it was said in reply, was the proposed Bill, and it contained no exemption in favour of vested interests; and if a Juries Bill could be carried which gave privileges to pharmaceutists from which others engaged in the same business were excluded, might not this new medical Bill inflict something equally unpalatable upon the unincorporated, unregistered, and unrecognized members of the drug trade? If the proposed measure has done nothing more, it has stirred up many of those who had previously remained callous to the appeals made to them by the advocates of pharmaceutical education and organization, and it appears to have opened the eyes of many to the necessity of at least doing something in furtherance of those objects.

In the discussion of this subject the members of the Pharmaceutical Society have not until recently taken a prominent part. They have manifested a disposition to wait the result of the decisions to be arrived at by the medical licensing bodies, and founded upon these the final decision of the Medical Council. From the first introduction of the subject it has been felt that the principles involved in the propositions relating to pharmacy in the proposed Bill are in the main such as have always been advocated by the supporters of the Pharmaceutical Society, and although in some respects these principles have not recently been acted upon, nor any attempts made to carry them into effect, this has arisen from the influence of past experience with reference to pharmaceutical legislation.

It has always been a prominent object with the leading supporters of the Pharmaceutical Society to extend the education, examination, and registration which have been established to all the members of the trade, and to make examination and registration necessary qualifications for the practice of pharmacy, at least in its higher departments. It was even at one time suggested that the College of Physicians should be associated with the Pharmaceutical Society in carrying out this object, so that all that is comprised in the first three propositions accords with views that have been entertained by the active promoters of pharmaceutical legislation. We are not aware that any change of opinion has taken place on these points excepting with regard to the practicability of carrying them into effect. The support given to Mr. Bell's Pharmacy Bill in the form in which it was submitted to Parliament, was not calculated to encourage the expectation that the Legislature would sanction the restriction of the practice of pharmacy to examined men, and the tendency of legislation since that time, with reference to medicine, has been rather in the other direction. The most that has latterly been looked for has been the exclusive right to the use of a title implying qualification by those whose qualifications have been tested and proved by examination, and some privilege in other respects, such as exemption from serving on juries, which it might be found practicable to afford them. In the discussion of questions affecting the welfare of the Pharmaceutical Society within the last two or three years this view of the subject appears to have prevailed, and any attempt to get more exclusive privileges has been considered hopeless.

But the success attending the efforts made two years ago with reference to

the Juries Bill, the disposition manifested in the Medical Council as evidenced by the proposed new Bill, and above all the interest which has recently been excited among members of the drug trade who were previously passive, seems to indicate a concurrence of circumstances favourable to the attainment of objects which, if not sought after, have at least been desired by those who are well-wishers to the cause of pharmaceutical progression.

A large body of chemists and druggists who have previously stood aloof and declined to act in concert with the Pharmaceutical Society, are now anxious to join in making a vigorous effort for the attainment of an Act that shall secure to all who are now engaged in business as chemists and druggists the rights and privileges they at present possess, while it shall render a professional examination necessary for those who enter the business in future. The members of the Pharmaceutical Society have at the recent numerously-attended meeting, held for the special purpose of considering the subject, expressed a decided opinion in favour of such a proceeding, and the outline of a Bill which it is proposed to introduce into Parliament will be found at page 458 of the present number of this Journal. Almost the only difference of opinion that appeared to exist at the meeting was, with reference to the extent to which it was desirable for the members then present to indicate to the Council the course that should be pursued. The meeting was in every respect a most satisfactory one, not only with regard to the numbers who attended and took part in the proceedings, but also with regard to the general purport of what was said, and the conclusions arrived at. There was no disposition to shackle the Council, in whom full confidence appeared to be reposed, nor were any over-sanguine anticipations expressed which would be likely to result in much disappointment. All concurred in desiring to see the object realized, if possible, which has often been foreshadowed, sometimes looked upon as rather utopian, but which the majority seemed to think there was a better chance of realizing now than on any previous occasion when the subject has been mooted.

It now remains to be seen what can be effected in other quarters. The Council will have to decide upon the details of a measure that will accomplish what is desired, and at the same time is thought to be practicable. To carry such a measure it will be necessary to secure all the influence that can be commanded. If the chemists and druggists throughout the country act in unison, and if the Medical Council, and especially the profession they represent, support the measure in accordance with the proposition which a Committee of the Medical Council have already advanced, the Legislature may be induced to give a favourable consideration to the subject. But it must not be forgotten that the only legitimate object of legislation is the good of the public at large, and unless it can be shown, which, however, it certainly can, that the object we have in view is calculated to afford some real benefit to the public, we have no sufficient ground for an application to Parliament. When any measure is proposed which appears to affect principally some limited portion of the public, a suspicion very naturally arises that it is intended or calculated to promote the interests of a class to the detriment of the general public. In the present case it can be shown that the welfare and safety of the public require that those who are engaged in dispensing the medicines ordered by medical men, should be fully qualified for the duties they undertake. The public have repeatedly asked for some protection against the accidents which sometimes occur, from ignorance or other causes, in the sale and use of poisons, and what better security could be afforded, as far as the sale is concerned, than to restrict it to qualified men? Might not the sale of such dangerous substances as prussic acid, and the poisonous alkaloids, be restricted to registered pharmaceutists and chemis's, as well as the dispensing of medicines?

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

FINANCIAL STATEMENT—*From 1st January to 31st December*, 1863.

RECEIPTS.	£.	s.	d.	£.	s.	d.
Balance in Treasurer's hands				283	16	8
,, Secretary's hands				2	4	9
Benevolent Fund:						
Subscriptions	78	18	6			
Donations	128	3	0			
Interest	169	2	11			
				376	4	5
Life Members' Fund:						
21 Life Members' fees	£110	5	0			
Interest	63	3	1			
				173	8	1
Government Securities:						
Interest				29	0	0
Rent				83	10	0
Fees:						
Lecture				122	6	6
Laboratory				399	14	0
Registrar:—						
36 Pharmaceutical Chemists. . . .	216	6	0			
44 Assistants	184	16	0			
73 Apprentices . . .	153	6	0			
106 Registration Certificates	5	6	0			
				559	14	0
Donation to the Society				1	1	0
Subscriptions:						
349 London Members	366	9	0			
1432 Country Members	1503	12	0			
93 Associates	48	16	6			
66 Apprentices	34	13	0			
				1953	10	6
Arrears of Subscription				96	17	6
Balance due to Secretary				5	5	1
				£4086	12	6

EXPENDITURE.	£.	s.	d.	£.	s.	d.
Benevolent Fund:						
Relief granted	£90	0	0			
Investment	286	4	5			
				376	4	5
Life Members' Fund:						
Investment				110	5	0
Conversazione	66	19	4½			
Pharmaceutical Meetings	4	16	9½			
Sundries	2	0	4			
Repayments of Subscriptions in excess	6	6	11			
				80	3	5
House Expenses				22	2	9½
Rent, Rates, Taxes, and Insurance .				437	11	0
Repairs and Alterations				154	10	11
Fixtures and Fittings				55	11	7
Apparatus				9	10	0
Library				61	13	3
Museum				0	6	0
Furniture				3	11	2½
Stationery				9	4	3½
Postage				62	6	5
Printing and Engraving				91	10	3
Advertisements				56	8	6
Journals, balance of Account				70	7	5
Carriage				2	15	1
Collector's Commission				27	7	5
Travelling Expenses				122	9	8
Salary to Secretary				276	11	0
Wages				161	6	6
Expenses of Society in Scotland . .				64	15	6
Board of Examiners				68	5	0
Professor of Chemistry and Pharmacy, including duties as Curator, etc.				300	0	0
Professor of Botany and Materia Medica, including duties as Curator, etc.				250	0	0
Subscription to Royal Botanic Gardens				21	0	0
Prize Medals, etc.				7	14	0
Laboratory:						
Director's Salary and Percentage on Fees	316	0	0			
Demonstrator	50	0	0			
Porter's wages	47	2	0			
Chemicals, etc.	137	15	6½			
				550	17	6½
Law Costs				188	17	5
Balance in Treasurer's hands				443	6	11
				£4086	12	6

We, the undersigned Auditors, have examined the Accounts of the Pharmaceutical Society, and find them correct agreeably with the foregoing statement, and that, as shown by the Books of the Society, there was standing in the names of the Trustees of the Society, at the Bank of England, on the 31st of December, 1863:—

	£	s.	d.
On Account of the General Fund, New 3 per Cents	£1000	0	0
Life Members' Fund, 3 per Cent. Consols	2475	12	2
Benevolent Fund, 3 per Cent. Consols	6182	19	10

FREDERICK BARRON,
JOHN CARR,
CHARLES DAVY, } Auditors.
WILLIAM MCCULLOCH,
BENJAMIN YATES,

February 25th, 1864.

AT A MEETING OF THE COUNCIL, *March 2nd*, 1864,

Present:—Messrs. Bird, Davenport, Deane, George Edwards, Evans, Hanbury, Herring, Hills, Mackay, Morson, Sandford, Savage, Squire, Standring, and Waugh,—

The following were elected

MEMBERS.

London ....Allen, Henry.
" ....Cornelius, James.
Salisbury ....Read, James.

The following, having paid their arrears and their registration fees for the current year, were

RESTORED TO MEMBERSHIP :—

Bury St. Edmund's ....Kirkman, Thomas.
Manchester ....Roberts, Thomas.
Staines...Earee, Thomas.
Sunbury ....Leare, James.

The objects of the Special General Meeting convened for the 17th inst., and correspondence relating thereto, having been considered and discussed, the further consideration of the subject was referred to the Parliamentary Committee, with a request that they would obtain the opinion and assistance of the Society's solicitors, and report to a Special Meeting of the Council.

BENEVOLENT FUND.

The following subscriptions to the Benevolent Fund, received during the month of February, were announced:—

Butler, Samuel, Bristol	0	10	0
Clayton, Henry, Eastbourne ...	0	5	0
Edwards, John B., Liverpool ...	1	1	0
Goodbarne, Thomas, Charles Place, Hoxton	0	10	0
Goodwin, John, Lower Clapton	0	10	6
Hollier, Elliot, Dudley	0	10	6
Harvey and Reynolds, Leeds ...	1	1	0
Jones, Humphrey, Llangollen...	0	5	0
Muskett, James, Harleston	0	5	0
Noakes, Richard, Brighton	0	10	6
Pratt, John, Chichester	0	10	6
Prior, George T., Oxford.........	0	10	0
Robinson, James M., Beverley	0	5	0
Savage, William D., Brighton...	0	10	6

A second donation of twenty-five pounds was granted to an aged and distressed Member of the Society.

SPECIAL MEETING OF THE COUNCIL, *March 17th*, 1864, 10.30 A.M.

Present:—Messrs. Bird, Davenport, George Edwards, J. B. Edwards, Hanbury, Herring, Hills, Meggeson, Morson, Proctor, Sandford, Savage, Squire, Standring, and Waugh.

The Parliamentary Committee brought up their Report and a draft of an Amended Pharmacy Bill.

EXAMINATION, *March 16th*, 1864.

MAJOR (Registered as Pharmaceutical Chemists).

Cooper, Albert ....Yeovil.
Dyer, Abraham Johnson ....Gosport.
Greaves, William Samuel..................Ironville.
Hamp, John ....Wolverhampton.
Magor, Martin ....Truro.
Reece, John ....Rotherham.
Saer, David Prothero ....Pembroke Dock.
Swenden, James ....Darlington.

MINOR (Registerel as Assistants).

Lasham, John William	Stratford-on-Avon.
Morgans, John Bowen	Milford.
Mills, John	Derby.
Norrish, Henry	Crediton.
Parry, William	Crickhowell.
Sells, Robert James	Canterbury.
Tanner, Benjamin	Exeter.
Warland, Francis William	Poole.
Watson, Richard Thomas	Bishopwearmouth.

REGISTERED APPRENTICES.

NAME.	RESIDING WITH.	ADDRESS.
Charles, Richard Emment	Mr. Davies	Cardigan.
Cole, George	Messrs. Ereaut & Son	Jersey.
Field, Henry	Mr. Maggs	Yeovil.
Heald, John Aulsebrook	M. Sinimberghi	Rome.
Hogg, Richard Bower	Mr. Jones	Carmarthen.
Hudson, Walter Jowett	Mr. Hudson	London.
Metcalfe, Wilson	Mr. Davis	Harrogate.
Palmer, Robert Frederick	Mr. Salisbury	Leicester.
Rogers, Griffith	Mr. Jones	Carmarthen.
Woods, William	Mr. Stocken	London.

EXAMINATION IN EDINBURGH, *March 9th*, 1864.

REGISTERED APPRENTICES.

NAME.	RESIDING WITH.	ADDRESS.
Gowans, Peter	Messrs. Duncan, Flockhart	Edinburgh.
Selkirk, James	Mr. Mackay	Edinburgh.

ERRATUM.—Page 341, *for* "Ashton, James," *read* "Ashton, John."

BOTANICAL PRIZE FOR 1865.

A SILVER COUNCIL MEDAL

Is offered for the best Herbarium, collected in any part of the United Kingdom between the first day of May, 1864, and the first day of July, 1865; and should there be more than one collection possessing such an amount of merit as to entitle the collectors to reward, a second prize, consisting of a Bronze Medal, and also Certificates of Merit, will be given at the discretion of the Council. In the event of none of the collections possessing such an amount of merit as to warrant the Council in awarding Medals or Certificates, none will be given.

The collections to consist of Phanerogamous Plants and Ferns, arranged according to the Natural System of De Candolle, or any other natural method in common use, and to be accompanied by lists, arranged according to the same method, with the species numbered.

The collector to follow some work on British Botany (such as that of Babington, Bentham, or Hooker and Arnott), and to state the work which he adopts. The name of each plant, its habitat, and the date of collection, to be stated on the paper on which it is preserved.

Each collection to be accompanied by a note, containing a declaration, signed by the collector, and certified by his employer, or a Pharmaceutical Chemist known to the collector, to the following effect:—The plants which accompany this note were collected by myself, between the first day of May, 1864, and the first day of July, 1865, and were named and arranged without any assistance but that derived from books.

In estimating the merits of the collections, not only will the number of species be taken into account, but also their rarity or otherwise, and the manner in which they are preserved; and should a specimen be wrongly named, it will at once be erased from the list.

The collections to be forwarded to the Secretary of the Society, 17, Bloomsbury Square, on or before the first day of August, 1865, indorsed "Herbarium for Competition for the Botanical Prizes."

If required, the collection will be returned after competition.

No candidate will be allowed to compete unless he be an Associate, Registered Apprentice, or Student of the Society, or if his age exceed twenty-one years.

FREE ADMISSIONS TO THE ROYAL BOTANIC SOCIETY'S GARDENS, REGENT'S PARK.

The following pupils of the Class of Materia Medica and Botany, in the Pharmaceutical Society, after examination in the Elements of Structural and Physiological Botany, were recommended by Professor Bentley to Mr. Sowerby, the Secretary of the Royal Botanic Society, for free admission to the Gardens in the Regent's Park, and the privilege was at once liberally accorded to them:—

Mr. J. Bingley.
— J. M. O'Eminson.
— J. Faulkner.
— C. Gorton.
— A. Hall.
— J. P. Iliffe.
— F. W. Jones.
Mr. C. J. Kinch.
— M. Magor.
— B. Shaw.
— H. Smith.
— F. Solomon.
— B. Tanner.
— J. Watts.

The above are arranged alphabetically, and without any reference to actual merit exhibited at the examination.

These orders will admit the above Students to the gardens upon ordinary days in the months of March, April, and August, from nine A.M. till one P.M.; and in May, June, and July, from seven A.M. till one P.M. Such orders, therefore, give every facility to those who possess them of making themselves practically acquainted with plants.

PHARMACEUTICAL MEETING.

Wednesday, March 2, 1864.

MR. SANDFORD, PRESIDENT, IN THE CHAIR.

The following

DONATIONS TO THE LIBRARY AND MUSEUM

were announced, and the thanks of the meeting given to the donors thereof:—

The Chemical News.
The Chemist and Druggist.
The Dental Review.
The British Journal of Dental Science.
The Photographic Journal.
The Educational Times.
The Technologist.
The Veterinarian.
The Medical Circular.
The Journal of the Society of Arts.
The Journal of the Chemical Society.
Bulletin de la Société de Chimie de Paris.
Kaiserliche Akademie der Wissenschaften in Wien; die Proceduren. Nos. 3–5. From the respective Editors.

Watts's Dictionary of Chemistry. Part 13. From the Author.

ON OXYGENNESIS.

BY MR. ROBBINS.

The subject I have the honour to bring before you this evening is the description of a new and easy method for the production of oxygen gas. The discovery of oxygen was made just ninety years ago by Priestley, who, in 1774, succeeded in separating it, and determining the nature of the atmosphere. In the following year the discovery was again made by Scheele (to whom Priestley's experiments were then unknown).

Oxygen is the most abundant of all known substances. It constitutes at least one-third of the solid mass of the earth, which, so far as we are acquainted with it, is mainly composed of metallic oxides and oxygen salts. In 100 parts, water contains 89, and atmospheric air 23, of their weight of this substance; it is likewise found in most organic compounds.

From the time of the discovery to the present, perhaps no subject has so much engaged the attention of chemists as the production of oxygen at a cost sufficiently low to be employed in the arts, for the reduction of metals, and other operations requiring a high temperature; and also for the purposes of illumination, the light obtained by it vying in splendour with the sun's rays. This desirable object has yet to be accomplished, and may be regarded as a prize to be won by some future happy discoverer. It does seem surprising, since nature has provided us so bountifully with this substance, and presented it in such a variety of combinations, that up to the present time there should be no known method of separating it, excepting at such a cost as excludes it for the purposes just enumerated.

In Gmelin's 'Chemistry' six processes are given for the production of oxygen.

1st. By heating chlorate of potash to low redness, 1 eq. of the salt yielding 6 eq. of gas, leaving a residue of 1 eq. chloride of potassium. As this process is slow and tedious, a small quantity of oxide of manganese is usually mixed with the salt, which greatly facilitates the decomposition, and the evolution of gas is both rapid and abundant. According to the authority just named, manganese is often mixed with carbonaceous matter, which passes over as carbonic acid; but another impurity I may mention is the presence of chlorine, which, I believe, may always be detected when oxygen is obtained by this method.

2nd. By ignition of red oxide of mercury. Oxide of mercury by strong ignition is resolved into mercury vapour and free oxygen. On account of the high temperature necessary for this experiment, it is recommended to first coat the retort with clay mixed with horsehair. Unless the oxide of mercury be very pure, the presence of hyponitric acid may be feared in the product.

3rd. By strong ignition of oxide of manganese. Three atoms binoxide of manganese Mn_3O_6 are resolved into Mn_3O_4 and 2 oxygen, which escape.

4th. By heating manganese with an equal weight of oil of vitriol. When manganese is heated alone, it is converted into Mn_3O_4; but when mixed with sulphuric acid the product is MnO,SO_3; by the presence of that acid, therefore, the product is increased one-half as much more. Practically, this method is not so economical as theoretically it appears. Glass vessels must be used, which invariably become fractured before the end of the operation.

5th. By ignition of nitrate of potash. This salt, when heated above its melting-point, is converted by the loss of 2 eq. of oxygen into nitrite of potash. On a further increase of temperature both nitrogen and oxygen pass off, consequently the product is always contaminated with nitrogen, which increases as the action proceeds.

6th. By the action of sulphuric acid on bichromate of potash. Three parts

bichromate of potash and four parts sulphuric acid are heated together in a capacious retort, an evolution of oxygen gas easy to regulate is the result. In this experiment we might congratulate ourselves if the process is conducted to the end without a fracture of the retort.

On glancing over the six processes just described, I think we may say that two only are now used, viz. chlorate of potash with and without manganese, and manganese alone: the latter is selected only for cheapness when a considerable quantity of the gas is required; chlorate of potash, with manganese for facility of operation; and chlorate of potash alone when purity is the principal object to be attained. More recently other processes have been recommended, one of which, by heating together a mixture of nitrate of soda and oxide of zinc, has been patented; from this mixture oxygen is said to be produced at a cheaper rate than by any other method at present known, Unfortunately for the value of this discovery, the produce is contaminated with a considerable percentage of nitrogen. Mr. Kuhlman, of Lille, discovered and published an ingenious and beautiful process for the production of oxygen by means of baryta. He found that by passing a current of common air through caustic baryta, heated to dull redness, peroxide of barium was formed, which, on an increase of temperature, is resolved into oxygen gas and caustic baryta, the latter ready again to perform its part in a similar operation. The idea naturally suggested itself that the means were now at hand for getting oxygen from the atmosphere in any quantity at a small cost. This method, although so promising, has been for the present abandoned. It was found that after a few operations, either from a molecular change or from the silica or other impurities, a sort of glass or fusion resulted on the surface, the baryta then refusing to act again.

We now come to the consideration of the new method for the generation of oxygen recently introduced by myself; the process, or the compound employed in it, has been named Oxygennesis. It will have doubtless been observed by you that in all the processes hitherto known a high temperature is necessary, and until that point is reached, no product whatever is obtained; this fact we may consider as the chief difficulty experienced in the preparation of oxygen, and more especially so when sulphuric acid is used. If, for example, by the mere addition of sulphuric acid to bichromate of potash in the cold we could get the same results which are obtained by the application of heat, this process, instead of being thrown in the rear, would have taken front rank. Oxygennesis therefore stands alone as a novel and the only mode we possess for producing oxygen without the application of heat. The mode of using this compound is extremely simple. We have only to take some of this powder, place it in a glass flask or bottle provided with an exit tube, pour on either of the dilute mineral acids, and we have immediately oxygen evolved in a similar way, and with as much facility as hydrogen is obtained from zinc, or carbonic acid from a carbonate.

The composition of this compound is extremely simple, merely a mixture of peroxide of barium and bichromate of potash; not so the chemical changes resulting from the addition of an acid. Peroxide of barium on addition of sulphuric acid is resolved into sulphate of baryta and peroxide of hydrogen, and it is from this sometimes so-called oxygenated water we get this curious and interesting chemical reaction. Whenever peroxide of hydrogen and chromic acid are brought in contact with each other, instantaneous decomposition is the result; the chromic acid is reduced to sesquioxide of chromium, and the peroxide of hydrogen to water, at the same time pure oxygen derived from both those substances is disengaged. The theory of this very interesting reaction is not, I believe, well understood, and I know only one way of explaining it, that is, on the ozône and antozone theory of Brodie. According to that

theory, oxygen exists in three different states or conditions, viz. ozone, antozone, and ordinary oxygen; and wherever ozone and antozone (which may both be considered more or less active) are brought together, they unite and neutralize each other as it were, forming passive or common oxygen.

To return to the composition of the powder, we are not compelled to use precisely those ingredients mentioned, but may substitute analogous compounds. Peroxide of barium might be replaced by any other peroxide capable of forming binoxide of hydrogen, of which there are several,—peroxide of potassium, sodium, strontium, and calcium, but all these at the present time are practically useless, peroxide of barium being the only one that can be easily and cheaply prepared. Bichromate of potash may be substituted by manganate or permanganate of potash, binoxide of manganese, or binoxide of lead; the cost of the two first-mentioned forbids their present use, and the one selected is by far preferable to the others. With regard to the acids, either of the mineral class will do, but I prefer sulphuric acid.

The next question demanding our notice is, in a commercial point of view, a most important one; however much this method may be admired for its simplicity, and the ease with which the operation may be conducted, its ultimate success or failure must depend on the cost. Can the oxygennesis therefore be manufactured and sold at a price sufficiently low to make it an article of commerce? I believe it can be, and be made available for all purposes whenever oxygen is required to the extent of some gallons. One of the ingredients of this compound, peroxide of barium, has never yet been produced and sold as a commercial article, and from the trouble in making a small quantity, but few, even practical chemists, care to prepare it for themselves. It can hardly therefore be expected that a compound of this nature can at once be manufactured and sold at a price it must ultimately be reduced to, if extensively used and produced in quantity. Five shillings per pound, the price hitherto charged, would, I admit, be a barrier to its general adoption; but I am happy to say we have now made the necessary arrangements to lessen the cost of production, and have at the same time reduced the price to three shillings for the one-pound bottle, and less if a larger quantity is required.

Some of the baryta compounds are found abundantly in nature, and are but of small value in the market, but up to the present time but few uses have been made of them; they now promise a much more extensive application. Mr. Kuhlman has perhaps done more than any one else to develope their uses and value in the arts.

In the 'Chemical News,' Nov. 28, 1863, will be found some interesting extracts from Dr. Hofmann's Report, one of the jurors of the Great International Exhibition, on chemical products and processes. He says, "Should the valuable property of baryta to absorb oxygen from the atmospheric air at a low red-heat, and to release it as a gas at a higher temperature, be rendered available to supply oxygen at a cheap rate for manufacturing purposes, a great impulse will be given to what is termed furnace chemistry, and our power over the more refractory provinces of the mineral kingdom be proportionately increased. This source of oxygen has hitherto remained practically closed in consequence of the decline which takes place after a few repetitions of the process in the power of the baryta alternately to incorporate and exhale the oxygen. This decline depends probably upon a modification rather in the physical than in the chemical condition of the baryta; and, if so, means probably exist to remedy the evil and render the operation perfect.

"A cheap process for the preparation of caustic baryta, and its derivative the peroxide of barium, would probably lead to the extensive manufacture of peroxide of hydrogen,—a compound whose powerful bleaching and oxidizing properties would render it an invaluable adjunct in many manufacturing pro-

cesses." The Report goes on to suggest many other applications where success may be expected, and adds:—"Nothing, it has been well said, seems so difficult as the invention of to-morrow, nor so easy as the invention of yesterday."

Dr. Hofmann concludes his review of these products with the following remark:—"On the whole, it may with truth be said, that of all the chemicals displayed at the International Exhibition of 1862, few have yielded to the researches of the last ten years a larger crop of careful results than barium and its compounds; and the reporter ventures to add, that none hold out a fairer prospect of similar advantages to come during (let us hope) the ensuing decade."

I shall trespass but little further on your time, but wish to make a few remarks on one of the various applications of oxygen, which may be of some interest to the medical profession and to pharmaceutical chemists,—I mean the employment of that body as a therapeutic agent by inhalation: for that purpose this ready method for producing the gas promises to be of great value. Toward the end of the last and the beginning of the present century, vital air, as oxygen was often and not inappropriately called, was used largely in this country and on the Continent; in this country we find the names of Drs. Beddoes, Hill, Thornton, and other physicians. Dr. Hill used it for more than twenty-five years, and Dr. Thornton was quite eminent for his successful application of it. At the present time the desire by medical men for the administration of oxygen has revived both here and abroad; two papers have recently been read, to be followed by others on the same subject, before the Academy of Sciences at Paris, by Messrs. Demarquay and Leconte. The experiments and observations of those gentlemen appear to have been very numerous and carefully made, both on animals and on man in disease and in health, and the conclusion they arrive at is, that oxygen is a valuable curative agent. If so good, then, as a remedy when its value was once known, what caused it to become and continue so long neglected? The explanation is, I think, not difficult. In the first place, when this body was discovered, too much was expected from it: the first furore for its employment arose from this simple experiment, the power to rekindle an expiring match, and as oxygen is the essential element of our existence, they calculated to be enabled in a similar way to rekindle the expiring vital spark; the more imaginative were elated at what they considered a discovery so long dreamt of, and so earnestly sought after by the alchemist. But oxygen is not the *elixir vitæ;* it will not restore grey hair to its original colour, nor make an old man young. The difficulties and expense attending its administration may also be considered other reasons for its non-employment. Of what use was it for a medical man to order that which the patient could not get supplied? A physician therefore having faith in the remedy, to adopt it was compelled to lay himself out especially for it, become an oxygen doctor, and prepare and administer the remedy himself. Those difficulties now no longer exist.

We have on the table an oxygen inhaler and generater, made according to the suggestions of Dr. Richardson. The generation of the gas is by this method so easy and so simple, that patients can prepare their own dose; or, if need be, the nurse after one lesson can as well undertake the operation as of any other duty she may be required to perform.

Physicians who may wish to employ this remedy may now prescribe it with no more hesitation than they would prescribe a black draught or a calomel pill.

Dr. Squire inquired if Mr. Robbins had patented his process, for if he had, he was inclined to doubt the validity of the patent, as he found, on looking at a paper by Professor Brodie, published as far back as 1851, that it was

there stated that when peroxide of barium was treated with an acid solution of bichromate of potash, oxygen was evolved. The same fact had also been adverted to by Professor Faraday, in a lecture at the Royal Institution. If Professor Brodie had patented the process spoken of at the time at which he referred to it, the patent would have been on the eve of expiration. When he (Dr. Squire) saw the subject of Mr. Robbins's paper announced, he immediately remarked that the process would no doubt consist in the use of precisely the compound which had been introduced to the meeting. He did not consider that the matter was sufficiently new to become the subject of a patent, but it would probably add to the number of instances tending to show the nuisance occasioned by chemical patents.

Mr. Robbins was not aware of the notice referred to in Professor Brodie's paper, although he was aware that the general nature of the reactions of peroxide of hydrogen was known to chemists. What he claimed in his patent was, the practical application of a known principle to a useful purpose, in the production of oxygen gas by a very easy method.

Mr. C. H. Wood said it was true that the reaction of peroxide of barium and bichromate of potash in the presence of an acid was known before the date of Mr. Robbins's patent, but it was by no means certain that this would invalidate the patent. He thought the principal objection to the process was the cost of the oxygen obtained by it, which was several times greater than it was when made from chlorate of potash. He could not even accede to the new process any advantage over the old process, with regard to the facility with which it was performed. But then Mr. Robbins claimed for his process the production of oxygen gas in a greater state of purity than it was obtained in by the action of heat on chlorate of potash and oxide of maganese, and he represented the gas produced by the latter process as contaminated with chlorine, and attempted to prove this by showing that it decomposed iodide of potassium, setting iodine free. This test, however, was insufficient to prove the presence of chlorine, as it gave a similar reaction with ozone or active oxygen. The late Mr. Witt had shown that oxygen obtained from chlorate of potash always contained a certain amount of ozone, and he (Mr. Wood) thought it was worth considering whether the medicinal efficacy of oxygen, if any, was not likely to be due to it in the active rather than the inactive state.

Dr. Redwood thought it was due to Mr. Robbins to state, with reference to the presence of chlorine in oxygen made from chlorate of potash, that the subject was some years ago investigated by Mr. Crace Calvert, who came to the conclusion that chlorine or an oxide of chlorine was contained in the gas. He (Dr. Redwood) was inclined to confirm this view from his own experience, and he thought if the effect of inhaling oxygen was being tried, it was desirable that pure oxygen should be used for the purpose. Mr. Robbins was entitled to the merit of having introduced a process by which oxygen gas was produced in a state of great purity, in which it was well suited for inhalation; and this process appeared also to present some advantages in the facility with which it was performed. It was certainly not so economical as the process usually adopted, nor was it likely to supersede that process in the laboratory while the price of the materials continued as at present; but if oxygen should be required to be made by medical men or by non-professional operators, Mr. Robbins's process would be found a convenient one. Although the principle involved was not new, the application, he believed, was so, and he would be sorry to say or do anything to deprive the author of the credit to which he was entitled, or of any more substantial advantage he might hope to derive from it.

The President fully appreciated the practical importance of the process introduced to their notice by Mr. Robbins. He had occasion recently to pro-

cure Barth's apparatus for compressed oxygen, and he had found it clumsy, difficult to use, and very expensive. Mr. Robbins, by his process, had obviated these objections. The difference in the cost of the oxygen by this and by the ordinary process of production, would not, he thought, be sufficient to interfere with its use as a remedial agent when the facility of its production was considered.

ON PERCOLATION.

BY MR. HASELDEN.

Some apology appears almost necessary for again bringing so soon before you the subject of Percolation and Percolators, but when I remind you that the British Pharmacopœia orders percolation combined with maceration to be employed in the preparation of thirty-nine tinctures and nine extracts, fluid and solid, that, I feel sure, will be a sufficient excuse for me. Now, feeling pretty certain that the process of percolation would be carried out to some extent in the B. P., I had entertained a faint hope that a percolator adapted to our requirements would have been sketched out for us; but, like the expectations of many others upon other points, mine upon this were not to be realized. It is not my intention to occupy your time by explaining how I have proceeded when percolating, because every one who has been in the habit of carrying out the operation knows as well as I do, and many much better, that it is just one of those things which can only be acquired by practice, and that is why each one likes his own mode of proceeding the best, although he may be quite willing to admit that his product is no better than his neighbour's, who slightly varies his *modus operandi*. A good manipulator will percolate (in the strict sense of the word) with almost anything, from a bottle with the bottom knocked out to the finest conical or cylindrical percolator; but a bad, unobservant manipulator will never percolate well with anything. My real object to-night is to show you a percolator which I have had made for myself, suitable for the usual process of percolation, and also for that of maceration and percolation as directed in the B. P. If not trespassing too much upon your time, I should like to tell you that my first real difficulty in percolation was to find a percolator that was not likely to break easily, and the first I had was one of Ayliffe's, made, percolator and receiver, of brown stone-ware. This soon got out of favour, as I could not see what product I was getting, and very soon the percolator or conical tube was cracked and leaked without any reason for the same. I then had one made of block tin, which I have used for some years, and which answered very well. I know that there are objections in theory to the use of any kind of metal, and some may be ready even now to say that it will change the colour of some of the tinctures, but practice proves the contrary. Now with the British Pharmacopœia came another trouble. The directions there given are that the material is to be macerated with three-fourths of the spirit menstruum for forty-eight hours, agitating occasionally; then transferred to a percolator; and when the fluid ceases to pass, pour into the percolator the remaining spirit. Now this implies one of two things,—either maceration in one vessel and percolation in another, or maceration and percolation in one and the same vessel. The employment of two vessels occasions extra labour, loss of time, and loss of material. Now I could not macerate with three-fourths of the material in my old friend, because the liquor would run through as soon as put in. I looked at my glass percolator made by the York Glass Company; it would do for small quantities, but I wanted one for large quantities, three or four gallons. Glass, then, was out of the question, especially as one of the extracts requires hot water. I then applied to Messrs. Maw, to make me the one you see here to-night, of block tin, the

same material of which they had made the small one, and I have every reason to think well of it. It is furnished with a tap at the bottom, by which I am able to macerate as long as required before I allow the fluid to pass through; it is cylindrical, and furnished with a movable perforated diaphragm, about two inches from the bottom, resting upon four supports; the ingredients are placed upon this diaphragm, and three-fourths of the spirit poured on as directed; a portion passes through and fills up the space between the bottom of the percolator and the diaphragm, so that the material while macerating is surrounded by the liquid: it can be well stirred during this primary part of the process. At the expiration of forty-eight hours the tap is turned, and the tincture or liquor allowed to pass through into a glass receiver, of almost any size, fitting the tap by means of a shive; that completed, the second perforated diaphragm is placed upon the top of the material, and the remainder of the liquid added. This having ceased to percolate through, the marc, as directed, is taken out, pressed, and the liquor mixed with the other portion, and the quantity of spirit added to make up the full measure of one or two gallons, as the case may be. Here is some compound tincture of cardamoms so prepared according to the form of the B. P., and I think no one will complain either of the colour or taste. The quantity of proof spirit lost in making two gallons was eight ounces. My only motive in showing this percolator is the pleasure I feel in giving you the small benefit of my experience. I claim no originality of idea beyond the material of which it is made; and I am sure that Mr. Maw will be happy to make them of any required capacity, should you approve of the idea.

A. F. Haselden.

18, *Conduit Street*, *March* 1, 1864.

Mr. Farmer thought the cost of Mr. Haselden's percolator would restrict its use. They could not afford to pay four or five guineas for such an apparatus, out of the profits derived from the sale of tinctures. He was accustomed to use a more simple form of apparatus, which he found to answer very well, but he did not approve of the process as directed in the British Pharmacopœia; percolation properly conducted was more convenient and more efficient than that process.

Mr. Haselden advocated the use of his percolator on the ground of its applicability to the Pharmacopœia process, an object which the pharmaceutist would now have to keep in view. It was merely the large size of the apparatus before them that rendered it costly. It could of course be made of any size suitable for their several requirements.

Mr. Mackay, of Edinburgh, had found the glass percolator of the York Glass Company a very convenient apparatus for operations on the small scale, and he believed this was also the experience of those pharmaceutists with whom he was accustomed to associate in the north. For operations on the large scale a metallic percolator was required, and the one before them appeared to be very suitable for that purpose. His own experience in the preparation of tinctures, and he believed it was also the experience of many others, was that many tinctures were made more conveniently and quite as well by the old process of maceration as by that of percolation.

Mr. Squibe thought the advantage of percolation over maceration had not been clearly established, while the difficulty of applying percolation in many cases was generally admitted.

Mr. Roberts did not think the term percolation could be strictly applied to the process described in the British Pharmacopœia. In conducting the process of percolation with effect, it was found necessary to have the solid ingredients reduced to a uniform, and as far as admissible to a minute state of

disintegration, and to have these carefully packed in the apparatus; but neither of these conditions were provided for in the Pharmacopœia process. He looked upon the process as a compromise between maceration and percolation, in which neither process was fully carried out.

Dr. Redwood agreed with the previous speaker, that the process of the British Pharmacopœia could not be correctly designated percolation. It appeared to be the result of a compromise, but he considered it a compromise in which displacement rather than percolation was appended to maceration. The terms displacement and percolation were both applied to the process, which had been so much extolled for several years past as a pharmaceutical process, and these terms were frequently looked upon as synonymous, but, in fact, although both equally applicable to that process when properly conducted, they did not both signify the same thing. Percolation signified the passing of each drop of the liquid from particle to particle through a compact mass of solid ingredients, until the drop became thus fully charged with soluble matter, and the solid substances by contact with a great number of successive drops of liquid were exhausted of the matter soluble in such liquid. The object of percolation was therefore that of exhausting the solid ingredients with a comparatively small quantity of liquid, but as much of this liquid is in that part of the process left in the solid mass, this has to be removed by continued percolation, and this constitutes displacement. Now in the Pharmacopœia process the exhaustion of the solid ingredients is effected by maceration, and the last part of the process is for the displacement or recovery of the solution held by absorption in the solid substance. He looked upon the process therefore, as a combination of maceration and displacement. In saying this, however, he did not mean to disparage the process of the Pharmacopœia. On the contrary, he was disposed to think that in its general characters it was likely to prove a good and suitable process for general adoption by chemists and druggists. It was necessary to bear in mind that the Pharmacopœia contained the instructions to be followed by all who were engaged, including the least experienced and skilled, in the preparation of medicines. The Pharmacopœia processes should therefore, as far as possible, be such as could be applied by operators of various amounts of skill and experience, and yet produce good and uniform results. It must be admitted that the process of percolation afforded an excellent method of preparing many tinctures, but it must also be admitted that it required in the operator a greater amount of skill and experience than the process of maceration required, and more than would be generally found among the fifteen or sixteen thousand chemists and druggists, including assistants and apprentices, throughout the country. He (Dr. Redwood) had been struck with an observation made by a speaker (Mr. Burden) at a previous meeting, to the effect that "he liked the process of percolation, but he liked to perform it himself." It was, in fact, a process which answered very well in many cases when performed by those who made it their study and practised it *con amore*, but it was hardly suitable as a general process, at any rate in the present state of pharmaceutical knowledge. Even among those who professed to understand the process, he believed errors were often committed, especially in the part relating to displacement. Some operators undertook to make a tincture by percolation, and to recover the whole of the product by displacing the tincture with water. This he considered to be practically impossible, and the attempt to effect it often caused greater discrepancies in tinctures thus made than in those made by the old process of maceration.

The President said he was sorry that time did not admit of their prolonging the discussion on this interesting and important subject. He was sorry also that so powerful an opponent of the general adoption of the process of

percolation as Dr. Redwood should have concluded the discussion for that evening, and have left the influence of his observations unanswered by those who took a different view of the subject. He then drew the attention of the meeting to a new form of percolator introduced by Mr. Gilbertson, of Ludgate Hill.

SPECIAL GENERAL MEETING OF THE PHARMACEUTICAL SOCIETY.

On Thursday, the 17th March, a Special General Meeting of the members of the Society was held, Mr. G. W. SANDFORD, President, in the chair, pursuant to the following requisition and resolution, which were read by the Secretary.

"*To the President, Vice-President, and Council of the Pharmaceutical Society of Great Britain.*

"Gentlemen,—We, the undersigned, believing that it is highly desirable for the protection of the public that all future Chemists and Druggists should undergo a due professional examination before commencing business, hereby request you to convene a General Meeting of the Members of our Society, for the purpose of considering the expediency of an immediate application to Parliament for an amended Pharmacy Act, by which (following the precedent of the Apothecaries' Act) *the legitimate interests of those already in business should be protected*, and proper provisions made for rendering the examinations of future chemists by your Board a compulsory instead of an optional proceeding."

In compliance with the above requisition, it was resolved at a special meeting of Council, held February 26,—

"That a Special General Meeting of the Members of the Society be held on Thursday, the 17th March, at twelve o'clock *precisely*, and that the notice convening the said Meeting, with the names of the requisitionists, be announced in the ensuing number of the Journal."

The PRESIDENT said,—We are called together this morning in compliance with the requisition you have just heard read by the Secretary, and which has been addressed to the Council from upwards of 300 members of our Society. Among the requisitionists, the names of men who entered the Society by the early method of enrolment under certificates of fitness, and of others who have taken their honourable position after the ordeal of examination, stand side by side, testifying strongly to the interest which seems to pervade the whole body in the question we are about to consider; and, indeed, that question is a most important one. It is proposed to ask the Legislature to grant that protection to the public now which was refused twelve years ago. The question will naturally divide itself into two parts:—First, *Is it desirable to do this?* If this be answered in the affirmative, the second point will at once occur to us. *By what provisions can we best attain the desired object?* Now, on the first point, I may assume that the mere fact of membership with a Society which was originally established to promote education and qualification among chemists and druggists, and has spent upwards of twenty years in the earnest endeavour to attain that end, is an evidence of your opinion as to the desirability; and I then ask, whether the time is ripe for the action you have urged the Council to take? We must all of us have observed the agitation which has been going on of late on this subject, and we cannot shut our eyes to the fact that the proposition of a Committee of the Medical Council to bring pharmacy within the scope, and pharmaceutists under the control, of that Council, has tended greatly to bring matters to a climax. I look up to the Medical Council with all honour and respect, as the power destined hereafter to take cognizance of all matters connected with the medical profession,

and I at once thank them for the opinion they enunciate, that dispensing chemists, on whom the public so much depend, and on whose ability and care the physician must so much rely in seconding his efforts, should be an educated body, and should not be allowed to exercise their calling without first giving proof of their qualification. I thank them, too, for the tribute they pay to this Society in acknowledging its certificate to be sufficient evidence of a man's fitness to dispense; but I believe firmly that the Medical Council have really no wish to interfere in pharmacy, they have enough to do with physicians, surgeons, and apothecaries; and although their proposition establishes pharmacy as a branch of the medical profession, I have no doubt they will gladly leave its management in our hands if we set to work earnestly and honestly in the matter. The expressed opinion then of the profession is in our favour. And what of the public? The press—I don't mean the *medical* press—has spoken out on the subject, advocating an examination, and admitting that this question should not be regarded as a mere matter of free trade; that the safety of the public requires some enactment such as that we now seek. These articles we have all been able to read—they are public. But there are, doubtless, other evidences of the feeling of the public to be gathered from our ordinary conversations with our neighbours and customers, and from such conversations each man must draw his own conclusions. The opinion of men in authority—perhaps I might say of the Legislature—to whom we must apply in this matter, may not be so generally known; but I may say for myself, that brought into contact, as I have been during the last few years, with members of both Houses of Parliament on questions concerning our Society, I have heard an opinion favourable to the examination of chemists expressed almost universally by them. I may even go further, for within the last two months, on making application to one of Her Majesty's principal Secretaries of State for a privilege to be granted to chemists and druggists,—a privilege to the granting of which I believe Government would not have been opposed, I was met by the difficulty that "*there was nothing to prevent any person opening a chemist's shop without having undergone personal examination as to qualification.*" But, Gentlemen, there is another party to the question,—the chemists and druggists themselves; and what of them? Why they tell us that they too desire to make examination compulsory. Preserve the rights of men already established in business,—which is, indeed, but common justice,—but let none enter the business hereafter who are not qualified. I may be too sanguine, but believing, as I do, that the medical profession, the public, the Legislature, and the chemists themselves, all agree in acknowledging the necessity for compulsory powers in this matter, I am inclined to hope that such powers may be obtained. In asking for them, we must be careful to provide due safety for the public, and to observe due liberality towards chemists already in business. Gentlemen, I will not trespass further on your time; I have thought it right to make these introductory remarks, and I trust you will now proceed to consider the subject before us calmly and thoroughly. I may perhaps be allowed to add, that the Council is as earnest as you can be to forward the matter; we have given great attention to it, not merely since, but before the receipt of the requisition.

Mr. Hollier, of Dudley, said, he was one of those who had been instrumental in getting up the requisition for holding that meeting, and he confessed he did not regret it when he looked around and saw so large and influential an attendance of members, which showed the deep interest that was felt in the important question they were called upon to discuss and seriously consider. He had felt great interest in the matter for a very long time, and he was able to indorse the sentiment of the President, that they had an ardent and an earnest desire to do all that lay in their power to promote the interests of the large

body of chemists and druggists. The subject was discussed by them three or four years since, when they stated their wish to admit outside men to the privileges of the Society, but the Solicitor had informed them it could not be done. He thought the time was now come when they should ask Parliament to convert their voluntary powers into compulsory ones. The question was, how was it to be done? Now he was disposed to open the door, as wide as it could be consistently done, having regard to the interests of the Pharmaceutical Chemist and those who had been established in business for a very long time; and he was glad that the Medical Council had so far taken up the question as to intrude it on our notice, which would have the effect of thoroughly ventilating it, and probably result in our obtaining an Act of Parliament, making it compulsory on all chemists and druggists to pass an examination before commencing business. He was instrumental in calling a meeting of chemists and druggists at Dudley, which contrasted most favourably with the noisy and undignified meeting held at Birmingham under the auspices of the United Society of Chemists and Druggists. At the latter meeting there appeared to be a desire on the part of the local secretary to excite opposition to the Pharmaceutical Society on the one hand, and an endeavour on the other hand to create an ill-feeling between the medical profession and the chemists and druggists; but he was happy to say, that notwithstanding that, he could vouch for the fact that many of the chemists and druggists present at that meeting expressed their readiness to join this Society, if it could by possibility be done. He believed that to be the general feeling of the body throughout the country. There were many outside the Society who were competent to dispense medicines, and to conduct their business equally as well as its members, and for his part, he should like to see the whole of them admitted; and it was a gratifying fact to him to find that out of the 300 or 400 members who had signed the requisition asking the Council to call that meeting, between 70 and 80 of them had passed the Society's examination. He looked upon it as an act of high liberality on their part, and as showing that they were content to rest their claims to public support on the honourable distinction they had so attained. He should like to see all chemists and druggists who were in business prior to 1852 or 1853, admitted into the Society on the payment of a certain fee; nay more, he would even go so far as to admit those who had commenced business since, if they were considered competent men. He would also extend the privileges of the Society to the assistants and students; leaving the details as to fees, etc., to the Council. His advice to the Society was to open the door so wide as to meet all the requirements of the profession, and by so doing hold, as they ought to do, the front position in the foremost rank, and not allow the United Society or any other body to cut the ground from under their feet. The proposal of the Medical Council, which was published in the Journal for July, 1863, he was under an impression for some time, had been quietly shelved, and he was so much surprised at its attempted revival, that he called the local meeting to which he had alluded. He rejoiced now to find that it was permanently shelved, so far as the interests of the Pharmaceutical Chemists were concerned. He however looked upon it as an unjust interference with their business, more especially with regard to the patent medicine branch, and he was very glad the Bill had been withdrawn. In the black country there were numerous shopkeepers who sold domestic medicines, and many articles used in business which come under the denomination of drugs; but he thought there would be great difficulty in meeting those cases; and although they might get powers for the compulsory examination of those who had to dispense or prepare medicines, he was afraid they would never get powers to stop the sale of those articles by small shopkeepers, that so much interfered with the

general business of a chemist and druggist. That was a matter that must be fairly met and properly considered, and he had no doubt it would receive the serious attention of the Council. He moved the following resolution:—

"That in the opinion of this Meeting it is desirable for the protection of the public that all future Chemists and Druggists should undergo a due professional examination before commencing business; and it is highly expedient that the Pharmaceutical Society make early application to Parliament for an Amended Pharmacy Act, by which the legitimate interests of persons already in business (whether as principals or assistants) should be protected, and proper provision made for the compulsory examination of those who intend to commence hereafter."

Mr. Bottle, of Dover, said he rose to second the resolution of his friend, which had been so ably proposed to them, with some diffidence, from the fact that it was but a short time since he had the honour of being a member of the Council, and that he was unwilling it should be construed into an unnecessary interference with their prerogative as the initiators by right of so important a change. Probably many of them had had more leisure and greater opportunities than members of the Council, of ascertaining, by the straws flying about, which way the wind was blowing with regard to the subject then under their immediate consideration. He, with others, had come to the conclusion that it was desirable they should now endeavour to obtain that for which the Society was originally projected, in addition to the education of its members; and that as soon as it was practicable, obtain the necessary enactment for making examination compulsory. And when they found the Medical Council on the one hand, and the United Society of Chemists and Druggists on the other, shaking the ground under their feet with some volcanic agency, he thought it behoved them to go at once straight to that object which had now for so many years been in abeyance. He would not for a moment have his old friends in the Council think that he was standing there and advocating that course as antagonistic to them. He knew that many of them entertained as liberal views as he did towards the outsiders, and he re-echoed all that had been said on that point by the mover of the resolution. He should feel it no discredit if they admitted into the Society men of his own standing, who had not hitherto availed themselves of the advantages of the Society as he had done. There might be some little delicacy about the matter, and he would be willing to meet it by giving those who had passed the Society's examination some exalted position, by which they might be distinguished from the ordinary body. He thought he might however say to them that they had already reaped an advantage on what they had paid, and the months they had spent in the laboratory, which would enable them to hold their own against any men, be they whom they might, that were admitted members without examination. He would say to those who came there to be educated, that they must bear in mind that though it cost them money, it cost the Society money also, their contributions not paying for the education which they received within the walls of the Society. He hoped that in opening the door, as was now proposed, to men of good standing outside, they would have no such opposition from men who had been educated in the Society, as would prohibit the Council from entertaining the question. They were not there that day to consider the clauses of a new Pharmacy Act, because they were not prepared to go into it, though he thought it was a subject that must have their serious attention sooner or later; but it would not do for them to be too precipitate about the matter. He felt there could be no two opinions as to the necessity and expediency of applying to Parliament for increased powers; but there might be a difference of opinion with regard to its particular provisions. He hoped there would be no difference of opinion as to the propriety of their admitting the present non-members, and that thereby they would be enabled to increase

largely their numbers by the addition of many good men, which would put the Society in a position to contend against anything and everything that might attack it in future.

The PRESIDENT said, that as the Solicitor's opinion, which he gave on a former occasion, appeared to be misunderstood by the mover of the resolution, Mr. Flux was desirous of explaining.

Mr. FLUX said Mr. Hollier appeared to have misunderstood him as having expressed an opinion that chemists and druggists could not be elected members of the Society without an alteration in the Pharmacy Act. No alteration of the Act was required to effect the object; an alteration in the Bye-laws would be sufficient; any new Bye-laws would be subject to the approval of the Secretary of State for the Home Department.

Mr. HOLLIER said he was glad to hear the explanation. He understood it in the other sense, and he had represented at local meetings, in consequence, that it would be necessary to go to Parliament for further powers for that object.

Mr. COLLINS looked upon that day as somewhat of a day of triumph for him. Not a year ago their then estimable President looked at him with something like horror, that he (Mr. Collins) and his friends should have brought under the notice of the Society the very question which was embodied in the resolution now under discussion. It must be evident to all thinking men that the Society must submit to extension, or it could not progress; and Mr. Bottle some years ago made a calculation how long the Society would last on its present basis, and named the year, he did not then recollect which, when the last man of the Society would pass into another world. It was certain, that at one time they had something like 4000 members, but they had dwindled down to about 2100, bearing but a small proportion to the actual number of chemists now in business. They had endeavoured to induce them to come in by every possible means, no doubt from a feeling that the ship was sinking; but what did they do to stop the leak? Why they took instead a very heavy cargo when they built those extensive laboratories at the top of the house. That it was that had pressed them down. They appealed to the general body to come in and enjoy the privileges of the Society, but they were deaf to their entreaties. Of the 2100 members only 430 had passed an examination; so that if they went on as at present, by the time the gentlemen who paid annual subscriptions and had not passed an examination had left this scene, they would not have a sufficient number of examined members to keep up the Society. They had hitherto failed in inducing young men to come there and obtain an excellent education, almost, as Mr. Bottle had said, gratuitously, for nearly all that the parents and guardians had to pay was for their maintenance during the time they were in attendance in the laboratory.

Mr. SQUIRE rose to order. The object of the meeting was to consider the definite proposition contained in the resolution, and not the discussion of the general affairs of the Society.

The PRESIDENT said he thought Mr. Collins was rather out of order, but he did not like to stop the discussion. He suggested that it would be better for the members to confine their observations as much as possible to the real object of the meeting.

Mr. COLLINS said that looking to the precise terms of the requisition, he considered he was in order. He was endeavouring to show the expediency of their adopting the resolution, as all their previous efforts to advance the Society had failed. They had been unable to induce the chemists and druggists as a body to join the Society; they were now going to adopt a different policy, and they had called that meeting for the purpose of asking the members who were possessed of certain privileges, whether they were willing that others should partake of them.

The PRESIDENT said that was not the question, but whether it was expedient or not to go to Parliament for an extension of the powers of the Pharmacy Act. The simple question was, whether the time was ripe for their going to Parliament for an extension of their Act.

Mr. GEO. EDWARDS said it had been just ruled by their lawyer that they did not want an Act of Parliament to admit the outside chemists and druggists, and therefore they need not argue that point now.

Mr. GILES, of Clifton, said it would be convenient for the meeting to know whether other resolutions were to follow the one then under discussion; because if so, they had better confine their observations strictly to what was before them. If not, he thought the meeting should have the privilege accorded to them of entering fully on every point they might think it necessary to bring under the notice of the Council.

The PRESIDENT said he had been informed that probably other resolutions would follow, in the consideration of which Mr. Collins's remarks would be more appropriate. He thought they would save time if they discussed and considered each resolution on its own merits.

Mr. W. B. RANDALL, of Southampton, said it would be better not to confine the various speakers strictly to the resolution before the meeting. If they did so, he thought it would defeat the objects they had in view. As one of the requisitionists who had a desire to support the Council in what they wished to do, he thought they should hear everything the various speakers might have to say.

The PRESIDENT said, that on the part of the Council, he disclaimed any wish to check discussion, but desired only that gentlemen's remarks should be as pertinent to the resolution as possible. The question they were there to consider had nothing to do with the admission of members.

Mr. COLLINS said he understood they had assembled to consider generally the expediency of going to Parliament for extended powers, and the object of his remarks was to show that it was so, by bringing forward such facts as he believed proved that their past policy had not been so successful as they all—the Council included—could have wished. The number of persons who had passed the Major examination since the foundation of the Society was 821, and the Minor 923, and he brought forward that fact to show that they had failed in inducing chemists and druggists to come forward in large numbers and pass an examination. He believed that if they could get Parliament to give them the powers they wished, of compelling every person, before he commenced business as a chemist and druggist, to pass an examination here, they would be doing a great benefit to the trade, and giving to the public a great protection. The voluntary system had failed, and a compulsory examination met with his entire approval. There were very few professionally educated men to supply the wants of the public, and the few there were, were exposed to the unlimited competition of ignorant and stupid persons. He should give the resolution his cordial support.

Mr. PEDLER said that he thought they should hear everything that could be said on both sides before they came to a conclusion on the resolution. He agreed in the opinion that it was a very important question they had to consider, and he should wish to see passed in review all that the Pharmaceutical Society had done, before they came to a definite decision on the subject. He hoped the discussion would not be narrowed to one particular point, because he thought the more liberty they gave to the speakers the more likely were they to come to a unanimous decision. He considered they ought to go to Parliament for extended powers. He would rather the initiative in this matter had been taken by the Council, and that they had prepared a scheme for the opinion of the meeting, rather than it should have been taken up by an individual

member. They must bear in mind there was great difficulty in carrying any particular clause in a Bill. They had had experience in that matter, and they all knew the sacrifice of time, money, and almost life, which it cost their lamented President, Mr. Jacob Bell, in obtaining the Pharmacy Act. The same difficulty will meet you in this case, for they would scarcely find a man in the House of Commons who would throw his heart into the work as their late President did. There, however, was this one advantage in their favour now, that they had been recognized by the Government, by their giving a preference in their appointments to young men who had been educated here. The Pharmaceutical Society, as a body, ought to be the only persons who should be entrusted with the dispensing of prescriptions and the compounding of medicines, because they were an educated body, and he felt considerable pride in saying that the Pharmaceutical Society had started up during the last twenty years a very intelligent class of young men, who were capable of doing anything in connection with their business. This was an institution of which every chemist and druggist might, if he chose, become a member. There had been no exclusion on our part. The founders of this Society had established a great and glorious institution, which he had no doubt would continue to flourish for centuries to come. They had placed within the reach of every young man the means of obtaining a good, sound, practical, professional education, which was the best thing he could start with; and if young men only knew how beneficial it was to them, there would not be room for another student in the Laboratory. He believed the time would come, however much they might put it off for the present, when they must go to Parliament for compulsory power, so that only competent persons should be able to prepare prescriptions. He approved of their altering the bye-laws so as to bring in all the chemists and druggists who were in business in 1850 or previous to that time, and who could be properly recommended, on the payment of a small fee, and he hoped the Council would speedily take action for the accomplishment of that desirable object. He thought, however, that young men who had lately commenced business, and assistants ought to pass an examination, or it would be inflicting a wrong upon those who had; and he asked his friend (Mr. Collins) if he wished to see a greater success than would be sure to attend such a line of policy. He very much disapproved of a sweeping measure that would prevent the men in the black country and similar small shopkeepers, which were to be found in every village, from selling Epsom salts and senna, because it would be a great injustice to them, and in many instances it would be a great hardship to the poor. In fact they would never get such an Act of Parliament. They had been told that in this free-trade country no one class could have exclusive privileges. Their Bill must stop short at prescriptions, and not interfere with small shopkeepers in small villages who sold ordinary domestic medicines. Confining the business to properly qualified men would be beneficial to the body and protective to the country. Restricting the number in a town would give them the chance of a better living than they now get; because there would only be one or two in a village who would keep to the one trade, instead of there being, as now, half-a-dozen unqualified men, who were obliged to add other things, and were "anything you like" rather than chemists or druggists, whose apprentices had no training or means of studying. In arguing for the admission of those chemists and druggists who were in business at a certain time, it was not his wish to bring the present Pharmaceutical Chemists down to the level of chemists and druggists, but to hold out the hand of fellowship to them and lift them up to our high position. Such a proceeding would do more to solidify and make this a good, prosperous, and worthy institution than any other course they could take.

Mr. B. Orridge said that Mr. Hollier did not advocate their taking in the

small men in the black country to which he alluded, or similar men in the small villages. Mr. Pedler had alluded to their late venerated friend Jacob Bell. But what were his views on this question? If they referred to the early numbers of the 'Pharmaceutical Journal' they would find that he continually urged that ultimately compulsory examination must be the rule, and not the exception. He had had repeated conversations with him on this subject, and knew thoroughly what were his views upon it. He (Mr. Orridge) was one of the founders of the Society, and he had always felt deep interest in its progress. It appeared to him that so long as they continued the voluntary examinations, the Pharmaceutical Society would not have that standing which it ought to have as a national institution. By making the examination compulsory, they would greatly benefit the public, and give prosperity and permanence to the Society. He also wished to enrol all thoroughly competent persons now in business.

Mr. Abraham, of Liverpool, said that so many had expressed a particular view of the question, that he, who entertained a different opinion with regard to the question then before them, ventured to try if he could not elicit some expression of sympathy with his own. Those who had already addressed the meeting were evidently in favour of protection. Now, he thought it was rather too late to raise such a cry. He believed that Government would never grant protection in the sense in which the meeting asked it, and he hoped they never would, because he did not believe the Society's object would be promoted by any such means. He believed the Society was progressing, and he inferred from the numbers that had been given by Mr. Collins, that though the diminution was inevitable, it was perfectly satisfactory, so far as the stability and usefulness of the institution was concerned. Such a state of things must have been foreseen by those who had paid attention to the constitution of the Society. They must have foreseen that as the members who had been admitted without examination died off or left the Society, their places would not in the first instance be filled up by examined and certified Pharmaceutists; but the Society was every year, by means of the examined members and their means of a still longer experience, becoming more and more a body to be looked up to and universally respected by the members of the medical profession. If they did not lower its character by admitting members less qualified by study and experience, every person who intended to take a respectable position as a Pharmaceutical Chemist would pass the examination of the Society; he would no more think of beginning business in a town without their certificate, than a surgeon now does without his diploma. Many were under an erroneous impression with respect to the privileges now possessed by the medical profession. There was no compulsory examination for either branch of that profession, except the pretence of one with reference to apothecaries. The Medical Act only gave them power to use a certain title, such as physician, surgeon, or apothecary, and made it penal for a person not so entitled to use it. They had the same privileges. As Pharmaceutical Chemists, they were protected in the use of that title by law, and any one falsely using it was, he believed, liable to a penalty. He desired nothing more, and he believed none of them would be more benefited by having any further protection. Class interest was said to mean robbery of the people, and every political economist who knew anything of the nature of the opinions held by the Parliament of the present day, must know that that definition would be given to it by them. He said that such a compulsory measure as they sought to obtain, if granted, would be a robbery of their neighbours. They had no right to prevent a man from taking medicines which he thought would do him good, prescribed by any one he chose; he might go to the most ignorant and take his pills, if he chose, but he (Mr. A.) did not recommend him to do so. He was

as strongly of opinion as any one present, that for the due exercise of the functions of a Pharmaceutical Chemist an elaborate education was necessary; but then he considered he had no right to interfere with the opinions of those who differed from him. There were numbers of persons, and some of the members of the learned professions, who took pills manufactured by known impostors because they were advertised in the newspapers, because they thought they did them good, and always would take them, though he thought them very foolish, and the members of that Society had no right to prevent them. If a man thought that Parr's pills, or any other advertised nostrum, would do him good, what right had the Pharmaceutical Society, or any body of men, to step in and say he should not do so? He believed they had no more right to deprive the public of the services of such persons, than they had to prevent their listening to the teaching of divine truths by illiterate individuals. It might be that many men believed that a person who had not received a university education was equally capable of teaching the truths of revealed religion as the man who had, and they had no right to prevent them. Gentlemen appeared to think that the most effectual thing for the profession was a compulsory examination, but he considered they had not shown that they should be the persons to apply for such powers. If they wished to ask for some exclusive powers for themselves, do it by all means; but remember at the same time that they were not asked to do it by the great body of chemists and druggists. It would be time to ask for a Bill authorizing the Society to register them when they called upon the Society to do so, but at the present time they might think the Society's proposed proceeding an impertinent interference.

A Member asked if Mr. Abraham was aware that the Medical Council proposed to introduce into Parliament a Bill for the compulsory examination and registration of chemists and druggists.

Mr. Abraham replied that he was aware of their proceedings. He asked the members of the Pharmaceutical Society who were desirous of seeing a compulsory examination established, if they were ready to take the consequences? Had it occurred to them why it was that the Medical Council wished for such powers? Was it not one of their grievances that chemists and druggists interfered with their profession by prescribing medicines,—by undertaking a duty for which they were not qualified? He entirely agreed with the medical body in that respect; but it was proposed now to go even further than that, and he asked them if they were prepared to take the consequences. The medical profession entertained the idea that none but those who had passed the Colleges of Physicians, Surgeons, and Apothecaries, should in future prescribe medicines, and many of them believed that chemists and druggists were transgressing that principle when they prepared and sold a cough mixture. They complained exceedingly of the encroachments on their rights by prescribing chemists and druggists. He was quite of opinion that they ought not to take upon themselves duties for which they were not qualified, and he thought they should pause, and well consider, before they accepted the principle laid down by the Medical Council. He felt certain that the chemists and druggists were not prepared to indorse it, because they were the persons who were most aggrieved and dissatisfied.

The President said there was one important matter with regard to the medical profession that must not be lost sight of. Mr. Abraham had said that their Act only gave them a right to a title. Now, by the provisions of the last Act, no medical man could recover his fees in a court of law unless he was registered under that Act. The Medical Act gave greater powers and privileges than a mere title.

Mr. Abraham said he accepted the correction.

Mr. Giles was of opinion that the question did not admit of two views,

but at first he was apprehensive lest they should not have fully expressed the views of the members. Had that been the case, it would have been most unsatisfactory, but he had every reason to think that by giving free expression to their opinions they would ultimately arrive at a unanimous decision upon the subject then before the meeting. He believed that very few medical practitioners were at all jealous of that kind of prescribing which could not be separated from the duties of a chemist and druggist, and which, in fact, the latter were, generally speaking, very unwilling to undertake. He should be glad if they could get rid of it, but he thought it would be a harsh proceeding to refuse to prescribe anything for a cough, and send the applicant to a medical man. Indeed, he did not think the medical profession, except those who were of no importance, were at all jealous on that point. The final question raised by the resolution was, whether compulsory examination was desirable or not, and Mr. Pedler appeared to entertain some doubt on that point; but he (Mr. Giles) considered now, as he always had done, that Mr. Jacob Bell was right in thinking that compulsory examination was desirable, and that at a time when free-trade ideas were more dominant than now. They had not got compulsory examination because they had not asked for it, but he was one of those who thought they should do so; and with regard to Mr. Abraham's observation, that there was no hope of our getting class legislation, he begged to remind him that, in addition to the medical profession, every attorney and every barrister had to pass an examination before he could practise. There were exceptions to every general rule, but was it expedient that there should be an exception in this case? It was not a question of free trade or protection, and with regard to himself personally, he was quite indifferent about it. Mr. Bottle had asked what would be the feeling of those who had passed an examination, to be brought down to the same level as those who had not, and he (Mr. Giles), though he cared nothing about it personally, thought, however, that they should maintain the value of the examination by adopting some distinguishing mark in the case of those who had passed. He did not think it wise to allow every one to assume the name of Pharmaceutical Chemist, which he believed had become of some value, or the effect would inevitably be to discredit it. Then, with regard to the present movement; was it desirable that the pressure should be from without, and had it been so? He understood that the Medical Council had, for the present, abandoned their intention of going to Parliament for such powers.

The President said the Medical Council had not abandoned it, but it had been sent back to the committee for further consideration. The committee sent in a report last year to that body, suggesting an amended Medical Council Act, which however was not adopted. It was possible that it might be again brought up at the next meeting of the Council, but of course he could not say what the Medical Council would do with it.

Mr. Giles said, that under those circumstances he thought it would be criminal, and that the Pharmaceutical Society would be abrogating their duties if they did not take action upon it,—it would be a neglect of duty on the part of the Council (who, it was known, were strongly interested in the welfare of the Society) if they did not move in the matter. Some action was looked for from the Pharmaceutical Society, and they ought not to disappoint that expectation, otherwise they would be lowering themselves in the estimation of the trade, and at the same time raising the United Society up to take their place. The United Society was taking energetic action on the matter. It would be necessary for the Pharmaceutical Society to do the same, and with regard to what should be done, he was indisposed to tie the hands of the Council. He should like the question to be remitted to them, to deal with it as they might consider best, even by co-operation with the Medical

Council. He also believed that as a voluntary institution the examinations, to which valuable privileges were attached, never would become so extended and universal as they ought to be. That could only be done by making it compulsory; and unless they became universal, they would fail of the great object for which the Society was established. He therefore earnestly hoped that the Pharmaceutical Society would take its proper course, whatever that might be, and he strongly urged that a great deal of latitude should be left to the Council, they receiving from the members an assurance that it was a matter to which great attention should be given. It was one in which they ought to use every possible means for carrying it out, and they should bear in mind that the objects they had in view when they founded the Society were still of as great importance as they ever were, and that they ought not to rest satisfied until they had been obtained, if possible.

Mr. Vizer, as an examined member, said they should deal with the question in a liberal spirit. At present a very large majority of the members were not members by examination. After all, they were a small body; but still those who were members by examination and held certificates, were ample proof of what might be done. The United Society was one with them, and although some of its members had spoken rather warmly and angrily of the Pharmaceutical Society, he thought that if they met them in a friendly spirit, they would be glad to co-operate and work with the Pharmaceutical Society. With regard to the question then before the meeting, he thought it would be better for them to leave it to the Council, because they had the best means of ascertaining and judging what was best for the true interests of the Society. They must deal liberally with those who had been in business for a number of years past. He had much pleasure in supporting the resolution.

Mr. Long urged as liberal a policy as possible, so as to defeat all opposition, and, if possible, render it unnecessary to go to Parliament for legislative powers.

Mr. Watts said, he thought one thing which had not been mentioned had operated on the minds of the members of the United Society, viz. the passing of the Juries Bill of last session. Those who resided in London, and had had to attend at Westminster and the Old Bailey, knew well how to appreciate that exemption, and he had no doubt that country members had experienced a similar benefit. The passing of the clause in that Act had no doubt stimulated the United Society to do something, if possible, like what the Pharmaceutical Society had done, that should be equally as beneficial to its members. Mr. Abraham in his remarks had made a mistake; he had confounded free-trade measures with professional education. Now Members of Parliament, like other persons, were considerably interested in the correct dispensing of medicine, and they had to run the same risk as the community at large, in having their medicines dispensed by ignorant and incompetent persons, who often committed fatal mistakes. He approved of their applying to Parliament for extended powers.

The President said, that before he put the resolution he would read a letter he had received from Mr. D. Hanbury:—

My dear Sir,—As some business engagements will probably prevent my attendance at the meeting to be held to-morrow, I take my pen to offer a few remarks upon the subject which is to come under deliberation.

In the first place, I may say that I fully unite with those who regard the present as an opportune moment for seeking to obtain such legislative enactments as will place pharmacy throughout this country upon the footing of a responsible and important profession. In saying this, I would have it clearly understood that I advocate no monopoly (such as exists in Germany), but simply that on and after a certain date, a certain scientific qualification shall be required from any person who may desire to commence the business of a dispensing or pharmaceutical chemist.

To effect this, it is admitted by all that a legal measure of some kind is necessary, but a considerable difference of opinion exists as to what measure will best conduce to the desired end; some advocate an extension of the Pharmacy Act, others that provisions touching pharmacy should be introduced into an amended Medical Act. Of these two courses, I am strongly in favour of the second.

That medicine, surgery, and pharmacy should be regulated by one comprehensive Act of Parliament appears to me highly advantageous, and I think that such a recognition of pharmacy on the part of the Legislature would be duly appreciated by the public as well as by the medical profession. I entertain no fear of the Medical Council wishing to act in any way to the prejudice of pharmacy; I believe it is the public good that that body has at heart, and that it would willingly listen to the suggestions of pharmaceutists in order that the amendments of the Medical Act, which it is about to seek, should most thoroughly conduce to their object. It should, however, always be borne in mind, that an enactment offering unmixed advantages is simply impossible; that in some cases it may work badly or cause hardship; and that all we can hope for is a balance of good in favour of the change.

In the examinations in pharmacy, I think it would be desirable that the Medical Council should be represented,—that is, that the Board of Examiners should comprise one member appointed by the Council; while, upon the other hand, I think that in the Medical Council there should be a pharmaceutical element,—that is, a member appointed by the pharmaceutical body.

Believe me to be, my dear Sir,

Yours very faithfully,

Plough Court, Lombard Street, March 16th, 1864. DANIEL HANBURY.

Mr. PEDLER asked if the Society had not now the power of compelling an examination, and whether that was not the rule they adopted.

The PRESIDENT said there was no power in the present Act to compel an examination, except on chemists and druggists becoming members of the Society. The present resolution was beyond the scope of the Pharmacy Act.

Mr. W. B. RANDALL said the question was not whether it was necessary something should be done, but how to do it. Mr. Hanbury's letter had altered the aspect of the thing altogether. He was not prepared to say it was a better way, if something comparatively compulsory was to be adopted, that it would come from the Medical Council. If so, at all events, it must be in a different manner to that suggested by Mr. Hanbury. There must be proper provision made for an ample representation of the Pharmaceutical Chemists, and if the Medical Council were prepared to allow their constitution to be so amended as to take Pharmaceutical Chemists into their body as part of the governing body, he thought they might submit to the government of that body; but if they refused to admit the Pharmaceutical Chemists on equal terms, then it was the duty of the Pharmaceutical Society to try if they could not get independently of any other body what they wanted. Many of the members of the Pharmaceutical Society who had been admitted without examination practically stood in no better position than many of those who had not joined it. When this Society was established, he was a student of University College, but it never occurred to him or his father that it would be advantageous for him to come here. He acquired professional education elsewhere, and from his knowledge of many of his contemporaries, he could state that they were as capable of performing their duties as he was, although they were not members of the Society, and in certain branches many of them were very superior men. He was also of opinion that if they amended the Pharmacy Act so as to admit all the chemists and druggists of the kingdom, that some means should be devised for distinguishing those who had been educated, and had passed the Society's examination. He was very desirous of giving the trade generally the means of enjoying the privileges and immunities of the Society, but he could not consent to their being placed on a level with Pharmaceutical Chemists. With regard to the question of compulsory examination, Mr.

Abraham, who had advocated the question on free-trade principles, had forgotten to state that whilst there was nothing to prevent a man from practising medicine, he could not use a title so as to mislead the public, but that if he did use a title, he must be first registered under the provisions of the Medical Act. He could not recover his fees without being registered, and if he committed a blunder he was dealt with more leniently than the non-registered man; in fact, there must be the grossest neglect or absolute neglect or wrong on the part of the qualified practitioner to get him convicted. Now if they could obtain an Act which confined the dispensing of medicines to Pharmaceutical Chemists, giving them the same privilege with regard to many matters that were possessed by the medical profession, he thought they might not fear what any other body of chemists and druggists could do. On those grounds he was disposed not only to encourage but to stimulate the Council to go for an amended Pharmacy Act.

Mr. Geo. Edwards said it was necessary before they went to the vote that they should understand exactly what they were about to do. Did the meeting understand the resolution as pledging them to the necessity of their seeking for a compulsory examination? Matters of great importance and well worthy the consideration of the Society had been introduced into the discussion; but as that was not the object for which the meeting had been called, he must beg they would not suppose that the suggestions which had been thrown out were binding on the Council because they did not then controvert them. He wished it to be distinctly understood, that by agreeing to the resolution the meeting was in favour of the adoption of a compulsory examination.

The President then again read the resolution, and said that although the word 'compulsory' was not in it, yet the purport and meaning of it was that the meeting, by adopting it, committed themselves to the principle of compulsory examination.

After some further discussion on this point, the word 'compulsory' was introduced, in order that there might be no mistake about the matter.

Mr. Dickinson said he had attended the meeting for the purpose of hearing if any arguments could be used showing that it was imperatively necessary that they should make the proposed change, but he must confess that the various speakers had failed in doing so. He had determined not to vote upon the question, and that being so, he considered it was his duty to offer some remarks to the meeting in explanation of that determination. Although he had not attended their meetings lately, he had always felt the greatest interest in the Society's welfare, and he was as anxious to see it prosper as any one. He wanted to know of those who were foremost in this movement, what had caused such a sudden change in their views. They were a body of Pharmaceutical Chemists, and as such they had no occasion to take any notice of anything that was done outside by any other body, especially the United Society. He had been suggesting motives in his own mind, and he had been listening to the observations of the various speakers for this great revolution in opinion, but he had not been able to arrive at a satisfactory conclusion for it in his own mind, nor had he heard any conclusive arguments advanced for it by others. Some speakers considered that the clause in the Jury Act had stirred up the United Society. No doubt it had, for it was a real tangible privilege which was confined to those who passed an examination, and they wished to participate in it. They were a select body, thinking and acting for themselves, and he deprecated their throwing away any of those advantages which they possessed, to any considerable extent. They had all private motives for what they did, and he believed it was not in human nature for them to do so. He should be sorry to vote in favour of their spending any portion of their accumulation in the extension of the

Pharmacy Act; and with regard to their going to Parliament, he considered it was not the right time, and that if they did, they would be defeated, and stand in a worse position than they did at present. The Jury Act, in his opinion, explained to some extent the outcry that had been raised by those outside, because they were perfectly content so long as they enjoyed equal privileges as ourselves, and they looked upon the Pharmaceutical Society as a bugbear. He was further inclined to believe that the trade generally were beginning to understand that the name of a Pharmaceutical Chemist carried an amount of respectability with it, and an implied qualification that they placed some confidence in it. Could they not, he asked, let well alone; they had gone on very well, and never mind the bugbear of dying of inanition? He did not believe in it. A reaction was taking place, from the simple fact that they had shown their power and influence by getting themselves recognized in the Jury Act. And where was the greater proof of it than in gentlemen joining the Society, and paying back subscriptions in order to participate in the privileges given by the Society? When Dr. Edwards announced that fact at Liverpool, he hardly knew the strength of the argument he was using. To talk of doing that which would be beneficial to the public, and to others who were engaged in the same trade as themselves, was all nonsense, and when he heard of those great changes he naturally looked to motives. He considered they ought to keep their position, and not go down, and pull up to their level those who had always opposed them; but let them try the experiment of going to Parliament, and he doubted not they would soon get tired of it. He was one with them, and what they had to do was to watch over their own interests, for he felt certain Parliament would never ignore the existence of so respectable a body as they had now become. He had no doubt the gentlemen who had proposed this change were acting in good faith, and he believed they were doing the best for the Society in their judgment, by bringing together, if possible, the two bodies who were practising the same business; but when they urged that the public interest required this change, he could not go along with them, because he knew the public were able under any circumstances to take care of themselves, and further, that they did so. If he could have supported the Council in this matter, he would readily vote for the resolution, but he found he could not. Mr. Hanbury, in his letter that had just been read, had shadowed forth a very excellent idea, and he recommended the Society to stand on their present vantage-ground, and not throw it away. He advised them to stand where they were, and protect their own members. The Medical Council, the United Society, or any other body going to Parliament, would find in the Pharmaceutical Society a body capable of taking care of themselves.

Mr. Lescher said this was a critical period for the Society. He was one of the requisitionists, and he had attended the meeting to hear the question discussed; but, he confessed, he was not then prepared to vote one way or the other. He therefore suggested the propriety of their adjourning the meeting to enable the members and the Council to well consider the matter in the meantime, and to hold another meeting upon the subject after the annual meeting in May. By that time the Council would no doubt be prepared to state what course they considered it would be best for them to pursue. Every effort had been made to induce the chemists and druggists to join the Society, and he was able to bear his testimony to the many efforts made by Mr. Jacob Bell for accomplishing that object; but they had stood aloof from the Society till now, and he believed it was owing to the Jury Act, which gave to Pharmaceutical Chemists a tangible benefit they must attribute the present movement. He thought it would be better for the matter to be referred to the Council for them to see what could best be done, with a view of extending

the benefits of the Society, without going to Parliament for additional powers. He therefore moved that the meeting should be adjourned for that purpose *sine die*.

The PRESIDENT said it would be better to refer the matter back to the Council, and that they be requested to report on it at the annual meeting.

Mr. LESCHER said he would accept the suggestion of the President.

Mr. PEDLER seconded the amendment.

Mr. ANDREWS supported the amendment. Mr. Hanbury's letter was worthy of more consideration before they decided on the question. He was of opinion that it was desirable they should co-operate with the Medical Council if possible.

A desultory discussion ensued, in which Mr. Breton, Mr. Collins, Mr. Orridge, Mr. Randall, Mr. Vizer, Mr. Freeman, Dr. Edwards, Mr. Foulger, and other members took part, relative to the adjournment of the meeting, and incidentally it was stated that going to Parliament for a new Bill would involve an expense of about £500.

The PRESIDENT put the amendment to the meeting, but it was negatived by 42 to 24.

In answer to a question by Mr. HOOPER,

Mr. FLUX, the solicitor, said that if the resolution was adopted, it would be necessary to go to Parliament to carry out its particular object.

The original resolution was then put and carried by a very large majority.

Mr. FLUX, at the request of the President, then read the heads of a Bill now under the consideration of the Council:—

After the 1st of January, 1865, no person to keep open shop for dispensing the prescriptions of duly qualified medical practitioners unless registered as a Pharmaceutical Chemist under the Pharmacy Act, or as a Chemist and Druggist under this Act. Examination established for all who commence business after that date.

Examiners under Pharmacy Act to be the Examiners under this Act.

Registrar under Pharmacy Act to be Registrar under this Act.

Chemists and Druggists in business in Great Britain before 1st January, 1865, entitled to be registered as Chemists and Druggists, on payment of a fee not exceeding one guinea, and saving to them all their existing rights.

Assistants and Associates under Pharmacy Act, who have passed Minor Examination, to be registered as Chemists and Druggists on commencing business.

Council of Pharmaceutical Society to make orders for regulating Registers to be kept.

Duty of Registrar to make and keep correct Register.

Evidence of Qualification to be given before Registration—of Examination on the part of those who enter business after said date;—of having been in business before said date by others.

Annual Register to be published and be evidence.

Penalty on wilful falsification of Register.

Penalty on obtaining registration by false representations.

Penalty on falsely pretending to be a registered person, or keeping open shop for dispensing said prescriptions, not being registered.

Registered Chemists and Druggists, having passed Minor Examination, may be elected as, and continue and use title of, Associate of Pharmaceutical Society, and may vote at Meetings of the Society.

Saving of rights of duly qualified medical practitioners.

Benevolent Fund may be applied to past Members and Associates, also to Pharmaceutical Chemists and Registered Chemists and Druggists.

Several members suggested that this Bill should be printed and circulated amongst the members for consideration. It appeared to receive the cordial assent of all present, but it was thought desirable that the absent members should have an opportunity of considering its provisions before the Council actually went to Parliament.

The meeting then separated, having cordially voted their thanks (which were moved by Mr. Watts and seconded by Mr. Gwatkin) to the Council and the President, both of which were suitably acknowledged by him.

PHARMACEUTICAL SOCIETY, EDINBURGH.

There was a meeting held in St. George's Hall on Tuesday evening, March 22nd; Mr. Kemp, Vice-President, in the chair.

There was a good attendance, Dr. Seller, Dr. James Young, Dr. Cowan, etc. etc., being present.

Mr. John Mackay made a communication regarding Robbins's new compound for the instantaneous production of pure oxygen gas. He named the composition of the *oxygennesis*, and explained the double reaction which took place by which the oxygen was eliminated; and having prepared several jars of the gas, he proceeded to burn charcoal, phosphorus, etc., in order to show its power in supporting combustion as compared with ordinary oxygen. Mr. Mackay further explained that Mr. Robbins had introduced this simple and ready method for the production of pure oxygen in order that medical practitioners might now, in the sick room, have an opportunity of testing the value of the inhalation of the gas as a remedial agent.

Dr. Seller made some remarks regarding the use and value of chlorate of potash in medicine, as well as of other oxidizing agents, and expressed himself much pleased with the new and ready mode now proposed for the production of oxygen for the use of the medical practitioner.

Thanks were given to Mr. Mackay for the communication he had made.

Mr. D. R. Brown read a paper "On Volumetric Analysis," with a special reference to its use as recommended in the British Pharmacopœia.

In commencing his paper, Mr. Brown observed that he was opposed to the name "Volumetric Analysis," given in the new Pharmacopœia to the method of testing which we were to follow out; for it was not by the separation of substances from, but by their addition to one another, that we were to arrive at our results; and therefore essentially a *synthetic* method, and not *analytic*. Volumetric synthesis might with propriety be applied to it; but its correct designation is Volumetric Estimation. Mr. Brown then proceeded to describe the manner of testing, showed a variety of tubes recommended for the purpose, and then examined, by the volumetric test, several articles, such as cream of tartar, chloride of lime, etc. etc.

On concluding a paper full of interest and ability, a vote of thanks was proposed by the Chairman to Mr. Brown, seconded by Mr. Stephenson, and carried with acclamation.

PROVINCIAL TRANSACTIONS.

LIVERPOOL CHEMISTS' ASSOCIATION.

Adjourned General Meeting, held February 18th, 1864, at the Royal Institution; the President in the chair.

Messrs. J. Price and M. Fox were elected members.

Mr. J. Abraham resumed his review of the 'British Pharmacopœia,' after which a discussion ensued, in which Dr. Morris, Messrs. Mercer, Heathfield, and others took part.

After a vote of thanks to Mr. Abraham, the meeting separated.

The Ninth General Meeting was held on the 25th February, 1864, at the Royal Institution; the President in the chair.

The following donations were announced to the Library:—The 'Pharmaceutical Journal' for February, from the Society; the 'Chemist and Druggist,' from the Editor. To the Museum, a specimen of Matico, from T. R. Arnott, Esq.

The thanks of the Society having been voted to the donors,

The PRESIDENT submitted a resolution for the adoption of the meeting, indicating to the medical profession the course it would be the duty of pharmaceutists and others to adopt in regard to the 'British Pharmacopœia;' but, after some discussion, it was agreed to withdraw the motion.

Mr. J. ABRAHAM then continued to a conclusion his review of the 'British Pharmacopœia,' of which the following is a *résumé*.

Mr. ABRAHAM occupied the evenings of February 11, 18, and 25, with a review of the 'British Pharmacopœia.' He expressed his great satisfaction with the changes in the weights, observing that they were in accordance with the opinions which he expressed in a paper read to the Society in 1855, and published in the 'Pharmaceutical Journal,' vol. xiv. page 411. He believed that they would conduce to the convenience of the pharmaceutist, and cause little or no inconvenience to prescribers. The grain, the scruple, and the drachm were unchanged, and these were the weights chiefly found in prescriptions. Although the Medical Council did not recommend the use of the terms drachm and scruple, they would continue to be as clearly understood as formerly. If prescribers forgot the change in the ounce, the error would only amount to ten per cent. By the system adopted, all ambiguity was got rid of, and if we chose to use the grain weight only, we should have a perfectly decimal system. He thought that the compilers of the Pharmacopœia had carefully studied practical results; and though he did not doubt that errors would be found in it, he believed that it represented much of the results of experience and the progress of science.

He proceeded in his review *seriatim*, with the especial object of calling attention to the changes which had been made with relation to the London Pharmacopœia. He regretted the exclusive introduction of the strongest nitric acid, and the calling of corrosive sublimate "chloride of mercury," which he believed would, in the hands of inexperienced persons, cause fatal mistakes. Also the change in the mode of preparing extracts from fresh leaves, which directed the chlorophyll to be first separated and afterwards added,—fearing that the product, although prettier, would be more perishable. The Pil. Coloc. Co. of the London Pharmacopœia had, he thought, answered every purpose; he regretted the introduction of a new one and of the old Ext. Coloc. Co., which had no advantage over it, and drove those who had not stills to the wholesale druggist. The compound rhubarb pill was now to have oil of peppermint instead of oil of caraway. He regretted this, because he remembered that when it was made from the old Edinburgh Pharmacopœia, then the only officinal form, many persons complained of the peppermint causing disagreeable eructations. The Ext. Opii Liquidum he supposed to be intended to represent Liq. Opii Sed. Measure for measure, it would be about as strong as laudanum; but he found that 75 drops of it were equal to one fluid drachm, whilst it took 136 drops of Tinct. Opii to fill the same measure.

The applying of the name of *spirits* to preparations which we already knew as *essences* would be inconvenient.

The appendices and symbols were valuable, and the book would be more frequently found in the laboratory than the old Pharmacopœia had been.

He noticed the omission of the names of many articles in general demand. Such as it was, the book was now the legal standard, although the medical profession might continue to prescribe from former formulæ if they indicated their intention on their prescriptions.

A vote of thanks to Mr. Abraham terminated the proceedings.

The Tenth General Meeting was held at the Royal Institution, March 10th, 1864; the PRESIDENT in the chair.

The following gentlemen were elected members:—Messrs. Thomas F. Austin and John Newman.

Mr. MERCER exhibited several sets of grain-weights from 4000 grains down, which were much admired.

Mr. MERCER then proceeded to read the paper of the evening, "On the Chemistry of the British Pharmacopœia," reviewing in a very able manner the principal changes in the chemical processes directed to be followed.

A cordial vote of thanks to Mr. Mercer for his able and interesting lecture concluded the proceedings of the evening.

N.B.—The Honorary Secretary desires to correct an error he unwittingly fell into in reporting the remarks of Dr. Edwards at the Eighth General Meeting on the 11th of February. The requisition referred to was not one emanating from the United Society of Chemists and Druggists, but from members of the Pharmaceutical Society addressed to the Council of that Society.

LEEDS CHEMISTS' ASSOCIATION.

The Fifth Meeting of the Session was held at the School of Art, on the evening of January 27th, when a lecture was delivered to a large audience of Members, Associates, and their friends, by Mr. J. S. Blockey, upon "Aniline Dyes; their history, chemistry, and practical applications." The lecture was copiously illustrated by specimens and experiments, and its author received the best thanks of the meeting.

The Sixth Meeting was held upon the evening of February 24; the President, Mr. Harvey, in the chair.

Mr. D. H. Cussons and Mr. E. Gaunt were elected Associates.

The President alluded to the removal, by death, since the last meeting, of two old and respected members of the profession.

First, their valued friend George Reinhardt, who had shown much interest in the Leeds Chemists' Association, and had been from the first a member of its Committee. No man was more respected or worthy of respect for his sterling and genial qualities, and many would feel with himself, that they had lost a personal friend. The Committee had felt called upon to adopt a minute expressing their high regard for their late colleague, and their sense of the loss sustained by his relatives and friends,—which had been handed to the family of the deceased.

They had also to regret the loss of Mr. Edward Smeeton, one of the oldest, if not the oldest chemist in Leeds, and who had for many years occupied a position in the front rank amongst us. He had not often attended our meetings, but had recently shown his interest by a liberal donation to the Library Fund.

Mr. F. C. Clayton (Associate) read a paper upon "Iodide of Potassium, and its Adulterations." After describing the various methods for the production of this salt, the author proceeded to describe in detail the adulterations or impurities to which it is subject. About ten specimens had been examined, including those of leading makers, both British and foreign, as well as some that were suspected to be inferior.

1. *Iodate.*—Qualitative examination by the test given in the 'British Pharmacopœia,' showed iodate in only one sample. To determine the quantity volumetrically is difficult; hence the author had made a comparative trial by treating a known weight of pure iodate of potash with tartaric acid, and noting how much of the suspected sample gave a similar depth of colour. He thus estimated 0·8 per cent. of iodate to be present in this sample.

2. *Chloride.*—Qualitatively, traces were detected in most of the samples by AgO,NO_5 and NH_4O. The amount was taken by a plan given by Fresenius: 2 grammes are dissolved in the smallest possible quantity of water, 2 cc. of NO_5 added, and then chloroform or benzole and more water. Agitate, when the liberated iodine dissolves in the chloroform, which is decanted and renewed as long as colour appears. The chlorine is left in the aqueous solution and is estimated by AgO,NO_5, either gravimetrically or volumetrically. No sample had more than one per cent. of chloride.

Carbonate.—Test-paper or lime-water prove its presence. Quantitatively, the author proposed the following ready method. A very dilute SO_3 (10 cc. = ·05 grm. KO,CO_2) is used as an alkalimetrical test upon a specimen of 1 to 4 grammes, dissolved in HO with a drop of tincture of litmus. The absence of iodate must be previously proved. No sample exceeded one per cent. of carbonate.

Sulphate.—The traces found in specimens of 1·5 grammes were imponderable.

Lime and *Magnesia* were not found in any specimen.

Soda.—In one case, an appreciable quantity was present. The chemical equivalent

would make it against the interest of the maker to substitute soda for potash, that a third party has doubtless supplied him with an impure carbonate of potash.

Processes for directly determining the iodide present:—

1. By HgCl. Having given much time to this process, the author found that it usually gave but 92 instead of 100, and finds a confirmation of his unfavourable opinion of the method in the fact that Fresenius does not give it.

2. By $PdCl_2$. Too costly.

3. Oxidation and titration by Cl water. (Sutton's Vol. Anal. par. 76). Too complicated for practical use.

4. Precipitate a strong solution by AgO,NO_5; wash, dry, and weigh, the mixed AgI, and AgCl. Determine chlorine separately and deduct. No sample gave less than 96 per cent. iodide.

The conclusions from these experiments must be, that the salt now in the market was commercially pure.

A discussion ensued, in which much satisfaction was evinced at the high degree of purity found. Mr. WARD moved, and Mr. ATKINSON seconded, a vote of thanks to the author, expressing the hope that his example would induce other Associates to contribute papers.

The Seventh Meeting for the Session was held on March 9th; the President in the chair.

Mr. R. H. DAVIS, of Harrogate, a corresponding member, read a paper upon "The Value of the Marc left in the manufacture of Tincture of Opium."

The author noticed the discrepancy between the statement of Pereira, who says that he often prepared morphia from this marc, and that of Dr. Garrod, who did not detect it, and found that in doses of thirty grains it was inert.

Experiments. The dried marc from three gallons of Tinct. Opii weighed thirteen and a quarter ounces, being the product of thirty-six ounces of opium in coarse powder. From this the morphia was very carefully extracted by processes which were fully detailed, and the final result was fifty-six grains of pure hydrochlorate of morphia (= forty-two grains of morphia).

The residue was treated for codeia, but without success.

The author said that he regarded two practical conclusions as being consequent upon the facts detailed, viz.:—1. That chemists who adopt percolation obtain a stronger tincture than that of the Pharmacopœia. 2. That it is worth while collecting the marc for the sake of the morphia.

Mr. RIMMINGTON (Bradford) and others took part in the discussion which followed.

Mr. R. M. ATKINSON read a paper upon "Liquor Ammoniæ Acetatis, B. P." He commenced by an historical notice of the preparation, evincing much research amongst the writings of the early chemists. It was first introduced by Raymond Minderer in 1621. He orders strong vinegar to be saturated with spirit of hartshorn. The vinegar of that country and period (Germany) was probably made from grapes, and the alkali would be literally what its name imports.

Attempts to prepare a concentrated solution by evaporating weaker ones have engaged the attention of many; but the author showed that the salt volatilized at a little over 90° F., and hence these essays were futile. The strength of the vinegar was sometimes increased by freezing. The formulæ used during the past two centuries in this and other countries were reviewed, and specimens exhibited prepared in accordance with some of these.

Arriving at the process of the British Pharmacopœia, Mr. Atkinson spoke with approval of the substitution of caustic ammonia for its carbonate. The specific gravity was now defined (1·060), and every facility was given for making it correctly, as the acid was of commercial strength and the saturation no longer difficult.

He thought Dr. Redwood's allusions to the advantages of any carbonic acid present in the old preparation as being hypercritical.

That we should have returned to the original process after 250 years' wandering was singular and interesting.

The thanks of the meeting were given to the authors of the papers.

NOTTINGHAM CHEMISTS' ASSOCIATION.

The Fifth General Meeting was held at the Society's Rooms, Exchange Buildings, on Thursday evening, the 3rd of March; Mr. S. PARR, President, in the chair.

The minutes of the Society were read and confirmed, and the donations to the Library announced. After which—

Mr. J. H. ATHERTON, F.C.S., read the first of a series of papers on the 'British Pharmacopœia,' briefly referring to the contentions which had taken place during the last thirty years between the three Colleges of Physicians of London, Dublin, and Edinburgh, in their efforts to effect a union of the three Pharmacopœias. The lecturer had to congratulate the members that the difficulties had been set at rest by an Act of Parliament conferring on the Medical Council the power and authority to prepare a national Pharmacopœia. He also referred to the difficulties and dangers attendant on having three different forms for medicines, and three different strengths in England, Ireland, and Scotland. This was of danger not only to the patient, but also to the dispenser of medicines. There was one instance he would allude to—namely, the prussic acid, the officinal strength of which was nearly twice as much on one side of the Tweed as on the other. A prescription, ordering that powerful preparation, dispensed in England one week, was probably dispensed in Scotland the next. In that case the latter would contain twice as much of the acid as the former, and yet the same directions are given for its administration. Mr. Atherton traced the history of the Pharmacopœia from the first one published in London in 1618 to the present time, remarking on the wonderful strides that science had made during the last few years. He did not think that the work represented the state of science in chemistry and pharmacy in Great Britain at the present time, and he was quite sure that it did not represent a fourth part of the time and money that had been expended in its production. There was a great deal of dissatisfaction expressed on all sides, and he (Mr. Atherton) could not but say the same. The omission of the Posological Table, the absurd changes in some of the preparations, the change of the names of some chemical preparations, the hurried manner in which it had evidently been completed, and the ridiculous omissions and mistakes, all tended to quite the reverse of an increase of respect towards the learned body of men in whose charge the compilation of the first 'British Pharmacopœia' was entrusted. The lecturer concluded his introductory remarks by referring to the great care and precaution requisite on the part of the dispenser of medicine during the next twelve months. He had always two things to consider; bearing in mind that after the publication of the Pharmacopœia, every dispensing chemist was bound by law to prepare every prescription written after that date with the new preparations. But he must also bear in mind that, comparatively speaking, very few of the profession had adopted the new forms, and that numbers had never yet referred to the new Pharmacopœia at all. Under these circumstances, what is the dispenser to do?—were he to act strictly according to the law, he would be acting against the wishes of the majority of the profession; and, on the other hand, were he to continue exclusively the use of the old Pharmacopœia preparations, he would be acting contrary to the direct commands of the Medical Council. The times were, in his opinion, fraught with difficulties to the chemist. Their most important qualifications were good common sense and discrimination: with these, there would be comparatively few dangers; but without these, errors innumerable must occur. The lecturer then commenced a review of the preparations, taken alphabetically, and considered chemically and pharmaceutically. The next paper would commence with the preparations of antimony, and would embrace subjects of more practical interest to the retail chemist than those to which he (Mr. Atherton) had taken occasion to allude that evening.

A vote of thanks was proposed by Mr. Francis (of London), and seconded by Mr. Marshall, to Mr. Atherton for his interesting paper, and carried unanimously.

The SECRETARY then read a paper on the influence of iron on vegetation, by W. W. Fyfe, Esq., honorary member.

After which a discussion took place as to the different forms in which iron existed in the soil, and its influence on vegetation.

The PRESIDENT said that no doubt the Society felt deeply indebted to Mr. Fyfe for his valuable and interesting paper. The treatment of vegetable chlorosis by means of the protosalts of iron was a most important discovery, and when more thoroughly understood, was capable of effecting considerable improvements in both agricult

horticultural sciences. Following up the experiments of M. Eusèbe Gris, Professor of Chemistry at Chatillon-sur-Seine, the discoverer, he had applied to a Wellingtonia, which was very sickly from being transplanted too late in the spring of last year, a solution of the protosulphate of iron, in the proportion of one ounce to a gallon of water, with very marked effect [for syringing only one-fourth of this strength ought to be used]. In about three months the plant appeared completely resuscitated, and is now quite healthy and strong. A similar result was obtained upon some rose-trees which were looking very dilapidated from the same cause; these also recovered, as it were almost by magic, their leaves assuming a green colour, and their flowers a more brilliant hue than all the rest in the garden. He had induced several of his friends to try the salts of iron upon weak and unhealthy plants, with corresponding results. He hoped those members who were fond of gardening would try similar experiments, and report them to the Society.

Mr. Atherton proposed, and Mr. Dann seconded, a vote of thanks to Mr. Fyfe for his paper, which was carried unanimously.

The SECRETARY introduced to the meeting some of Thonger's Patent Safety Labels for poison bottles.

LECTURES ON THE BRITISH PHARMACOPŒIA.

ON THE GALENICAL PROCESSES AND PREPARATIONS.

LECTURE II.

Delivered before the Members of the Pharmaceutical Society, March 16, 1864.

BY THEOPHILUS REDWOOD, PH.D., F.C.S.,

PROFESSOR OF CHEMISTRY AND PHARMACY TO THE PHARMACEUTICAL SOCIETY, AND SECRETARY TO THE CHEMICAL SOCIETY.

Although the use of medicines may be traced to the earliest times at which we have records of the history of man, subject as he has been to disease, and ever seeking to extend the duration of life, yet on looking to remote periods, it appears that the remedies employed were all derived from the organic kingdoms of nature, and especially from the vegetable kingdom. It was not until the fifteenth and sixteenth centuries of the Christian era that mineral medicines, or at least those of a definite chemical character, were introduced. About the middle of the fifteenth century, Basil Valentine, in his 'Chariot of Antimony,' ushered in a new system of medicine, and from that time dates the employment of chemical medicines. Valentine may be said not only to have introduced chemical remedies into medicine, but to have laid the first solid foundation for the science of chemistry. In his works we find the earliest intelligible description of practicable processes for the production of sulphuric, nitric, and muriatic acids, together with many metallic preparations, especially those of antimony; and these were vaunted as the only true remedies for disease.

Basil Valentine, who was a great chemist for the time at which he lived, was succeeded by a man whose name fitly represents his character. Theophrastus Bombastes Paracelsus was the enthusiastic, bigoted, and dogmatical advocate of chemical remedies, and the uncompromising and often infuriated denouncer of the system of medical treatment which then and previously prevailed, and which being mainly supported by the writings and authority of Galen, the great and learned physician of the second century, was distinguished as the Galenical system.

It was now that a fierce contest commenced between the advocates of chemical or spagirical remedies on the one side, and of Galenical remedies on the other. The votaries of Galen decried the use of chemical preparations in medicine, ascribing to them poisonous properties, and predicting serious in-

jury to mankind from the introduction of such mineral poisons into the human system; while, on the other hand, Paracelsus and his followers complained of the superstitious prejudices of those who confined their practice to the use of absurd and often disgusting compounds of animal and vegetable substances, to which were ascribed marvellous powers in counteracting the effects not only of natural diseases but of every kind of poison.

Speaking of the Galenical doctors, Basil Valentine says, "they write long scrolls of prescriptions, and the apothecary thumps their medicines in his mortar, and health out of the patient." And again he says, "Oh, if foolish and vain men would hear and understand what I write, they would not suck their turbid and insalubrious potions, but hasten to these limpid fountains, and drink of the well of life."

But Valentine, Paracelsus, and their followers were not allowed to have it all their own way. The Galenists long maintained the ascendant, and laws were even passed to prohibit the use of some of the more important mineral medicines. Thus, in 1566, a decree of the Parliament of Paris was issued against the use of antimony, and in 1609, an eminent Paris physician, Paulmier, was expelled from the faculty for having administered this medicine. But a change of opinion afterwards took place, and antimonial wine was admitted into the 'Antidotarium,' published in 1637. Antimony was much employed about the middle of the seventeenth century, although many medical men still considered it a poison and strongly condemned its use. At length the doctors assembled at Paris, in March, 1666, to the number of 102, to decide upon the merits of antimony, and a majority of 92 voted in its favour, upon which its use was authorized by Parliament.

For the first century or so after the introduction of chemical remedies they were not generally admitted into orthodox Dispensatories, and there was a distinct class of men, Chemists, by whom they were prepared; but in process of time, as the prejudice against this class of medicines gave way to more enlightened opinions, chemical and Galenical were no longer separated or distinguished, excepting by those who could discriminate between more or less definitely constituted bodies. In this country, the Pharmacopœias have from the commencement contained both classes of medicines; although the number of chemical remedies was at first small, and has been gradually augmented, while the number of animal and vegetable medicines has at the same time been gradually curtailed. The chemical products and processes of the London Pharmacopœia were thoroughly revised and reformed in the edition of 1788, when this part of the work was put into a form which did great credit to those who were engaged in its preparation.

At a still earlier period, namely, in 1746, a completely radical change was made in the Galenical preparations. The arrangement of the Pharmacopœia was then entirely recast, nearly all the old prolix formulæ which previously filled the work were rejected, and those which were substituted for them may be said to have originated and formed the bases of the Galenical medicines which have been employed in this country from that day to the present.

It is with the Galenical preparations, and the processes for their production as contained in the British Pharmacopœia, that I have now to deal. In treating of these, as I have already treated of the chemical preparations and processes, I shall endeavour, by means of tables, to represent the changes which have been made by the transition from the London Pharmacopœia. In the first column, under what may be called the generic names of the preparations, the numbers of species contained in the London and in the British Pharmacopœia are represented, and in the same column are also given any changes of name that may have been made. Then in subsequent columns will be found the preparations that have been omitted, or added, or altered. You

have thus a general view of the whole of the changes made in this class of preparations.

Galenical Preparations of the London and British Pharmacopœias compared.

Ph. Lond.	*Ph. Brit.*	*Omitted.*	*Added.*	*Altered.*
AQUÆ. 10. Mist. Camph.	 12. Aqua Camph.	Pulegii.	Fœniculi Laurocerasi	Anethi Carui Cinnam. Menth. Pip. Menth. Vir.
CATAPLASMATA. 6.	 6.	None.	None.	Conii
CERATA.		All omitted,	or transferred to	UNGUENTA.
CONFECTIONES. 11. Conf. Amygd. Conf. Arom.	 7. Pulv. Amygd. Pulv. Arom.	Aurantii Cassiæ. Opii Rutæ	Sulphur. Terebinth.	Piperis Scammon.
DECOCTA. 26. Dec. Amyl.	 13. Muc. Amyl.	Chimaphilæ Cinchon. Pall. Cinchon. Rubr. Cydonii Dulcamar. Gallæ Granati Hord. Comp. Scopar. Comp. Senegæ Tormentil. Ulmi Uvæ-Ursi	Scoparii	Aloes Comp. Cinchon. Flav. Hæmatox. Papaveris Taraxaci
EMPLASTRA. 14. Plumbi	 12. Litharg.	Ammoniaci Cumini Potass. Iodid.	Calefaciens	Belladonnæ Galbani Hydrargyri Opii Resinæ
ENEMATA. 6.	 6.	Colocynth.	Magnes. Sulph.	Aloes Assafœtidæ Opii Tabaci Terebinth.
EXTRACTA. 28. Inf. Cinch. Sp. Extr. Aloes. Extr. Elater.	 31. Ex. Cinch. Liq. Ext. Aloes Soc. Elaterium	Cinchon. Cinchon. Pal. Cinchon. Rub. Colocynth. Lactucæ Papaveris Pareiræ Uvæ-Ursi	Anthemid. Belæ Liq. Calumbæ Cannab. Ind. Colocynth. Co. Ergotæ Liq. Filicis Liq. Krameriæ Opii Liq. Pareir. Liq. Quassiæ	Aconiti Belladon. Conii Colchici Colch. Acet. Gentianæ Glycyrrh. Hyoscyam. Lupuli Stramon. Taraxaci

Galenical Preparations of the London and British Pharmacopœias compared—continued.

Ph. Lond.	*Ph. Brit.*	*Omitted.*	*Added.*	*Altered.*
INFUSA.		Armorac. Co.	Aurantii	Anthemid.
24.	27.	Aurant. Co.	Chiratæ	Buchu
Catechu Co.	Catechu.	Cinchon. Pal.	Cusso	Calumbæ
Cinchon.	Cinchon. Flav.	Cinch. Pal. Spis.	Dulcamaræ	Caryophyl.
Lini Co.	Lini	Rosæ Comp.	Ergotæ	Cascarillæ
Sennæ Co.	Sennæ.		Maticæ	Cuspariæ
			Rosæ Acid.	Digitalis
			Senegæ	Gentianæ
			Uvæ-Ursi	Lupuli
				Quassiæ
				Rhei
LINIMENTA.		Æruginis	Aconiti	Ammon.
10.	15.	Ammon. Ses. Carb.	Belladonnæ	Camph. Co.
			Cantharidis	Hydrargyri
			Chloroformi	Opii
			Crotonis	Terebinth.
			Iodi	
			Terebinth. Acet.	
MELLITA.		Rosæ.	None.	Boracis
4.	2.	Oxym. Scillæ		
MISTURÆ.		Gentian. Co.	Creasoti	Ammoniaci
9.	7.	Sp. Vini Gal.	Scammon.	Ferri Comp.
st. Acac.	Mucil. Acac.			Guaiaci
st. Camph.	Aqua Camph.			
MUCILAGINES.		None.	Tragacanthæ	None.
None.	3.			
Mist. Acac.	Mucil. Acac.			
Dec. Amyl.	Mucil. Amyl.			
PILULÆ.		Aloes Comp.	Aloes Barbad.	Cambog. Comp.
15.	16.	Aloes c. Sapone	Aloes et Assafœt.	Colocynth. Co.
Ferri Co.	Ferri Carb.	Conii Comp.	Aloes Socotrin.	Rhei Comp.
Sapon. Co.	Opii	Ipec. c. Scilla	Assafœtid. Comp.	Aloes c. Myrrh.
Galban. Co.	Assafœt. Co.	Styrac. Comp.	Colocyn. et Hyosc.	Pil. Calom. Co.
Hyd. Chlor. Co.	Calom. Co.		Ferri Iodid.	Pil. Ferri Carb.
			Plumb. c. Opio.	Scillæ Comp.
PULVERES.		Aloes Comp.	Amygd. Comp.	Scammon. Co.
9.	12.	Cinnam. Com.	Aromatic.	Tragac. Comp.
Conf. Amygd.	Plv. Amyg. Co.	Cretæ Comp.	Catechu Comp.	
Conf. Arom.	Pulv. Arom.	Creta Co. c. Opio.	Cretæ Arom.	
P. Ipec. Co.	P. Ipec. c. Opio.		Cret. Arom. c. Opio.	
			Rhei Comp.	
SPIRITUS.		Ammon. Fœtid.	Cajuputi	Menth. Pip.
14.	11.	Anisi	Juniperi	Myristicæ
		Carui	Lavandulæ	Rosmarini
		Cinnam.		Ammon. Arom.
		Junip. Comp.		Sp. Camphor.
		Menth. Virid.		
		Pimentæ		
		Pulegii		
		Vini Gallici		

Galenical Preparations of the London and British Pharmacopœias compared—continued.

Ph. Lond.	*Ph. Brit.*	*Omitted.*	*Added.*	*Altered.*
Succi.			Conii	
None.	3.		Scoparii	
			Taraxaci	
Suppositoriæ.			Acid. Tannic.	
None.	2.		Morphiæ	
Syrupi.		Althææ	Aurant. Flor.	Aurantii
17.	15.	Cocci	Hemedesmi	Limonis
		Croci	Scillæ	Papaveris
		Rhamni	Ferri Phosph.	Rosæ Gall.
		Sarsæ		Sennæ
		Violæ		Zingiber.
Tincturæ.		Aloes Comp.	Arnicæ	Aconiti
53.	56.	Ammon. Comp.	Bucco	Aloes
Camph. Co.	Camph.c.Opio.	Cinchon. Pall.	Cannab. Ind.	Belladon.
Cinchon.	Cinchon. Flav.	Colch. Comp.	Chiratæ	Calumb.
Colchic.	Colch. Sem.	Conii	Cocci	Cardam. Co.
Fer. Ses. Chl.	Fer. Perchlor.	Cubeb.	Conii Fruct.	Castorei
Iodin. Co.	Iodi	Ergotæ Æther.	Croci	Catechu
Rhei Co.	Rhei	Fer. Ammo. Chlor.	Ergotæ	Cinnam.
Sennæ Co.	Sennæ	Hellebori	Krameriæ	Digitalis
			Nuc. Vomicæ	Fer. Perchlor.
			Sabinæ	Gentian. Co.
			Senegæ	Iodi
			Stramonii	Limonis
				Lupuli
				Myrrhæ
				Opii
				Rhei
				Sennæ
				Serpentar.
				Tolutani
				Zingiber.
Unguenta.		Conii	Aconitiæ	Antim. Tartar.
27.	28.	Hyd. Nitr. Mit.	Atropiæ	Belladon.
Ant. Pot. Tart.	Ant. Tartar.	Opii	Calomelanos	Cantharid.
Gallæ Co.	Gal. c. Opio.	Picis	Cocculi	Cetacei
Hyd. Am. Chl.	Hyd. Ammon.	Picis Liq.	Gallæ	Creasoti
Hyd. Nit. Ox.	Hyd. Ox. Rub.	Plumb. Carb.	Hyd. Iod. Rubr.	Elemi
Cer. Resinæ.	Ung. Resinæ.	Plumb. Iodid.	Plumb. Carb.	Gallæ c. Opio
Cer.Plumb.Co.	Un.Plumb.Co.	Sambuci	Plumb. Subacet.	Hydr. Ammon.
Zinci.	Zinc. Oxid.	Sulph. Comp.	Simplex	Hydr. Nitrat.
		Sulph. Iodid.	Terebinth.	Hydr. Oxid. Rub.
			Veratriæ	Sulphuris
				Zinci Oxidi
Vina.		Veratri		Aloes
7.	6.			Ferri
Ant.Pot.Tart.	Antimon.			Ipecac.
				Opii

I now propose taking these preparations in alphabetical order, and offering such remarks upon them as appear to be most called for. In doing this I shall endeavour to give as practical a character as I can to the matter, but

I may occasionally digress into the regions of speculation; and this may serve in some degree to enliven what would otherwise be a rather dull subject.

Aquæ.—The distilled waters used in medicine are a class of preparations to which little importance is attached by some persons, who view them as mere vehicles for more active medicines, and therefore undeserving of much attention. The method of preparing them has been frequently changed, and for some years past the object aimed at appears to have been to simplify and render as easy and expeditious as possible the processes for their production, rather than to give to the products qualities of which they are susceptible, and which would add to their medicinal efficacy.

The processes given in the London, Edinburgh, and Dublin Pharmacopœias, have all differed, and I think I may say they have all been to some extent wrong. The London College have, for most of the waters, authorized two modes of preparation: the one consisting in distilling the seeds, bark, or herb, from which the medicinal properties are to be derived, with water; and the other in mixing the essential oils, previously obtained from those sources, with powdered silica and distilled water, and then filtering the mixture. There are two exceptions to the liberty thus given to adopt either of two processes, and they are in the cases of Rose water and Elder-flower water. The Edinburgh College, while they give a sort of implied sanction for the use of essential oils, by stating in their introductory remarks that the distilled waters 'may also be prepared for the most part by agitating the volatile oils of the plants with water and filtering the solution," nevertheless direct in the processes given that the vegetable substances—seeds, barks, herbs, etc.—should be distilled with water and a small quantity of spirit, three fluid ounces of rectified spirit being used in the production of a gallon of the distilled water. Then, again, the Dublin College order the "waters" (for they do not call them "distilled waters") to be made by mixing alcoholic solutions of the volatile oils with distilled water, and filtering the mixtures.

Now, of these several processes, taking them all together, it may be said that while there are good ones among them, there is nothing in the Pharmacopœias to show which are good and which bad; and in every case, except two, where good processes are given, they are accompanied by a permission, if we think proper, to adopt another, which is a bad process.

I consider the processes of the Dublin College objectionable, because, as a rule, these waters cannot be made in the greatest state of perfection by dissolving the volatile oils in water, and because the addition of spirit is calculated to produce an injurious effect upon the product. The processes of the Edinburgh Pharmacopœia are also objectionable, for although in most cases the waters are directed to be prepared from the right sources by the proper means, namely, by distillation, yet the result is in some degree marred by the addition of spirit, which, instead of promoting the preservation of the waters, as was no doubt intended, has been found to induce acetous fermentation, and thus cause the waters to become acid. It is in the London processes, of those I am now referring to, that the best processes for distilled waters are to be found; but even here the good are so mixed up with bad, that it is just a chance which happens to be adopted.

In the British Pharmacopœia much judgment has been manifested in the adjustment of the processes for the distilled waters. All that was bad in the previous Pharmacopœias has been carefully weeded out, and all that was good has been judiciously retained. The waters are all made by distillation, and by distillation with water alone, without any spirit. Some of them are made by distilling essential oils with water, and others by distilling the vegetable substances containing the essential oils; and in all these cases I think the right processes have been indicated.

Now, some persons may perhaps be disposed to say that all this is of little importance, for what are the distilled waters but mere solutions of essential oils in water, and what can it signify how the solution is made, whether by diffusing the oils through water by means of spirit, or some absorbent powder, or by distillation, or in any other way? There may perhaps be a slight difference in the results, but as the products are chiefly used as vehicles for more active medicines, the influence of such differences must be inappreciable.

I have heard such remarks as these made with reference to this subject, but I feel assured that you entertain a very different opinion. The distilled waters are certainly among the mildest of our Galenical medicines, but this does not render it any the less necessary to attend to those details by which the greatest perfection may be attained in the products. If we put side by side some of these waters made by different processes, we shall find marked differences,—if, for instance we take cinnamon-water made from the oil, even by distillation, and much more if made by mere agitation with water, and compare it with the water obtained by distillation from cinnamon-bark, the difference is not merely fanciful or trifling, it is not unimportant with reference to the properties of the product in a medicinal point of view. The water made by the first method is deficient in all the best qualities of good cinnamon-water. Much the same thing may be said of pimento-water, made in the one case by solution or distillation from the oil, and in the other case by distillation from the berries. The latter would be found to be better, and to keep much better than the former.

It may be stated as a rule, that these waters, when made from seeds, or barks, or flowers, are best made by distilling these vegetable substances with water alone, and making no further addition to them. They are thus ordered to be made in the British Pharmacopœia, and I believe no improvement could be made upon the processes there given. When the flavouring constituents of the waters are derived from the herbaceous parts of plants, the results are different. We may sometimes get satisfactory results by distilling herbs, such as peppermint, with water, but we cannot thus depend upon uniformity of results. The waters so prepared are more variable, and not generally so agreeable, as those made by distilling the oils with water. There are two of the waters in the British Pharmacopœia in which the oils are directed to be used, namely, peppermint and spearmint, and they are the two which experience seems to indicate as those best prepared in that way.

I cannot quit the distilled waters without making a few remarks on the subject of distillation as a pharmaceutical process. This is a very ancient and a very efficient process for the separation of the more subtle and often more active constituents existing in natural products, or resulting from operations to which they may be submitted. The early chemists were curious, and laborious, and patient in the performance of this and other processes. A great variety of forms of apparatus were employed by them, and arrangements were adopted which, to the modern pharmaceutist, would appear strange and fantastical. Not only were there different forms of distillatory apparatus used, but heat of different kinds was applied, and to the products of these various modes of manipulation peculiar virtues were ascribed. Thus, in addition to the distillation effected by the heat of a fire, the process was sometimes conducted by the heat of the sun's rays, and sometimes by the mild heat of fermenting animal or vegetable matter, the apparatus being in fact stuck in a hotbed. Now, shall we say that this was part of the absurd philosophy of those days, and to be disregarded, together with the vain pursuit of the philosopher's stone and *elixir vitæ;* or may we not at least admit that

those ancient chemists and pharmaceutists were not only patient and laborious workmen, using with dexterity the means at their command, but that they were at the same time close, and often accurate, observers of the phenomena of nature? Modern science has fully established the difference which the ancient chemists assigned to heat derived from different sources; and while the off-handed, superficial chemist may be ready to say that the distilled waters of pharmacy are mere solutions of very minute quantities of essential oils in water, and that any one of the several processes described in our Pharmacopœias would be sufficient and suitable for their production, a more careful inquiry and a sounder philosophy may show that this is by no means a correct representation of the facts of the case.

We may safely assert that the distilled waters, when properly prepared, are not merely solutions of essential oils in water, just as distilled vinegar is not merely diluted acetic acid, and as that most valuable of medicinal agents, sometimes called *aqua vitæ* or *eau de vie*, is not merely diluted alcohol. In the production of the best Cognac brandy it is found necessary to use stills of a peculiar form, with low heads. In other cases we use stills with high heads, or with ascending instead of descending beaks. By these and other means we are enabled to modify the qualities of the products of distillation, and in the selection and application of such and such-like means consists the art of pharmacy. If you are satisfied with British brandy as a substitute for the real Cognac, you may be satisfied with diluted acetic acid as a substitute for distilled vinegar, or with solutions of essential oils that have been kept exposed to the air, and partially oxidized, as substitutes for the best distilled waters.

Cataplasmata.—These remain as they were in the London Pharmacopœia,—the same in number, in name, and in composition, with only a slight alteration in one of them, namely, Cataplasma Conii, in which the dried leaves of hemlock are substituted for the extract.

Cerata.—These are all omitted, or transferred to Unguenta under altered names.

Confectiones.—The number of these is reduced, four old ones are omitted, two new ones are introduced, two, namely, Confectio Amygdalæ and Confectio Scammonii, are altered in composition. In Confectio Piperis caraway is substituted for elecampane and fennel, and the sugar is omitted.

Decocta.—Considerable changes have been made in the decoctions. The number is reduced to just one-half of what it was,—namely, from twenty-six to thirteen, and only one new one has been introduced, namely, Decoctum Scoparii. The principal alterations in composition are in compound decoction of aloes, in which the proportion of aloes is increased, while the liquorice, myrrh, saffron, and tincture of cardamons are diminished; in decoction of bark, which is weaker than it was; in decoction of logwood, which now contains cinnamon; in decoction of poppies, which is increased in strength; and in decoction of dandelion, which is now made with dried root. Besides these alterations there are others of less importance, as, for instance, in decoction of bark we are now directed, after boiling for ten minutes, "to strain the decoction when cold." Previously we were directed to strain while the decoction was hot, the effect of which was to give a product that on cooling threw down a copious precipitate, and dispensers were often in doubt as to whether this precipitate should be mixed with the liquid when used or not.

From experiments made specially with reference to this question, I have found that although the precipitate contains quinine combined with astringent matter, yet the quantity of quinine present in the precipitate is so small, that it is not worth while, for the sake of its retention, to give a thick and muddy character to the decoction. I consider therefore that the new process is an

improvement upon the old one, for by straining the decoction after it has cooled, it is obtained in a comparatively clear state. Still, however, it is subject to the formation of a slight precipitate after standing for some days.

I may remark, with reference to this decoction, that the boiling of the bark with water, as directed, extracts rather less than one-half of the quinine that is contained in the bark; and if the residual bark, after being thus used, be boiled with water acidulated with sulphuric or hydrochloric acid, it will yield the remainder, amounting to about six or seven grains of the alkaloid from an ounce of bark.

But the most important changes in the decoctions are those which relate to the means of ensuring uniformity of strength and other properties in the products. Our processes hitherto have been very deficient in the means provided for this purpose. Thus, in the London Pharmacopœia the general instructions are either to boil until the decoction is reduced to a certain measure, or to boil for a certain space of time, usually ten minutes. Both these methods are liable to yield variable results, according to the quantities operated upon, and the form of the vessel in which the decoction is made. It is quite obvious that if I were making half a pint of decoction in a vessel presenting a large surface to the fire, I might boil it all away in ten minutes; whereas, if I were operating upon two or three gallons, I should effect but a comparatively small reduction of volume in the liquid in that time. So also, if I had to reduce nine ounces of liquid to six ounces by boiling it, I could do so in a few minutes; but if I had to reduce nine gallons to six gallons, it would be necessary to boil it for a much longer time, and under these circumstances the ingredients would be subject to a much longer application of the boiling process in the one case than in the other, so that the products would be likely to vary in their characters.

Now, some attempt has been made in the new Pharmacopœia to remedy these defects. In the process for compound decoction of aloes, and also in that for decoction of bark, instructions are given which appear to be unexceptionable. We are directed to boil the solid ingredients for a specified time (ten minutes) with a quantity of water that would not under any circumstances yield the full amount of decoction required, and then, after straining this, the quantity specified is to be made up by pouring water over the ingredients in the strainer.

After having thus adopted so excellent a process for two of the decoctions, it seems extraordinary that the same method should not have been applied to other similar preparations. Why, for instance, should it not be applied to the preparation of the decoctions of poppies, sarsaparilla, and taraxacum. It is true that we are told in the instructions for making those decoctions that the ingredients are to be boiled for ten minutes, and that the product is to be made up to a specified quantity; but we are not told to make up the product by the displacement of the liquid retained in the marc, and as the loss in boiling will vary according to the quantity operated upon, if the product is made up in any other way than by displacement, the product will be subject to variation.

Emplastra.—The number of plasters is reduced from fourteen to twelve, three being omitted and one added. There are some alterations in several of those that are retained, and these appear to be improvements.

Enemata.—With reference to these I have little to remark beyond what the tables indicate. The number is unchanged, one being omitted, and one added, while the others are altered in strength or composition.

Extracta.—The medicinal extracts are a very important class of preparations, containing, as they do, the active constituents of many powerful drugs, which are often administered in a concentrated state. The processes for the

preparation of these extracts necessarily differ in some of their details, because the sources from which they are derived, or the substances immediately yielding them, are very different in their characters and properties, some being vegetable juices, while others are aqueous, or alcoholic, or ethereal solutions, obtained by processes of extraction from the drugs operated upon; and these are submitted to evaporation to bring the products to the required consistence.

There are many points to be considered with reference to the preparation of extracts,—points relating to the method of extraction and to the process of evaporation. Efficient means are required for separating the parts of vegetable substances which should enter into the composition of the extract from other parts which it is desirable to reject. Some substances have to be rejected, because, being inert, they would lower the strength of the product too much. Others are objectionable because they promote decomposition of more active ingredients, either by setting up or supporting fermentation, or by inducing the growth of microscopic vegetation. On the other hand, it is sometimes desirable to retain substances which are themselves devoid of medicinal activity on account of their giving the required consistence, or some other requisite quality or character to the extract. We shall find in these various requirements an explanation of the objects contemplated in the modifications which have been made in several of the processes for the preparation of extracts in the British Pharmacopœia. Thus, the starch, which by previous processes was retained, is now excluded from the extracts of colchicum. In the acetic extract of colchicum the quantity of acetic acid is diminished. Albumen is also rejected from both extracts of colchicum, as well as from extract of gentian and others of the extracts. Extract of jalap is, as formerly, partly an alcoholic and partly an aqueous extract, but the aqueous extraction is now effected with cold water instead of hot water. Extract of hop is also an alcoholic and aqueous extract, but the aqueous extraction is here effected by boiling. Extract of stramonium, which was formerly an aqueous extract, is now made with proof-spirit. These I believe are all improvements, and so most decidedly is the alteration made in the extract of taraxacum. This has hitherto been a soft, treacly extract, containing products of decomposition, formed during the process; it is now a good and efficient extract, made by inspissating the expressed juice of the roots after separating the albumen. Lastly, we have an alteration in the extracts made from the expressed juices of green herbs. Instead of simply evaporating these juices, as heretofore, in the state in which they are obtained by expression, they are now submitted to two preliminary operations. The juice is in the first place heated to 130° Fahr., at which temperature the green colouring-matter (chlorophyll) coagulates, and this is separated by straining the liquor through a calico filter, and kept for subsequent use. The liquor is then again heated to 200° Fahr., to coagulate the albumen, which is separated by straining, and rejected. After these two separations, the liquor is evaporated by a water-bath to the consistence of a syrup, and the green colouring-matter being now mixed with it, the whole is evaporated to a proper consistence at a temperature not exceeding 140°. This process, which is applied to aconite, belladonna, hemlock, and henbane, certainly yields very good extracts, which are smooth, of a good consistence, and keep well without becoming mouldy. There is nothing to be said against the process with regard to the qualities of the products, assuming that these extracts are intended to retain all the colouring matter of the expressed juices. The process is similar to that which has long been adopted by manufacturers on the large scale, and which has been found to afford satisfactory results. Still, it is not exactly the manufacturers' process, but a refinement upon it, and it is doubtful whether this refinement is fully applicable to such operations as

are conducted by some of our wholesale druggists, and especially whether, if applicable, it is necessary. The usual mode of making these extracts is to heat the juice to near its boiling-point, and separate the chlorophyll and albumen, which at that temperature coagulate together; then to evaporate the strained liquor in a *steam bath*, and when reduced to a syrupy consistence to mix in the green colouring-matter, and bring the whole to a pilular consistence, finishing it off at a low temperature. As thus prepared, the extracts are not found to be deficient in the qualities that would characterize those made by the new process. The separation first of the chlorophyll, and afterwards of the albumen, by processes which require a nice regulation of temperature, may be thought to involve unnecessary trouble and loss of time in an operation in which expedition is of the greatest importance; and this will especially be felt in operating upon the large scale, where a ton or two of fresh herb is collected in the morning, and has to be converted into extract before the day has passed. All unnecessary delay is here a source of deterioration in the product, and this applies also to the means by which the evaporation is to be effected.

We are directed in the process, after separating the chlorophyll and albumen, to evaporate the strained liquor to the consistence of a thin syrup by a *water-bath*. Now the question arises here, what is meant by a *water-bath?* In former Pharmacopœias terms of this sort have been explained, but in this Pharmacopœia we have no such explanations, excepting with regard to weights and measures, and temperature. If we turn to the London Pharmacopœia, we find that "a water-bath is made when any substance contained in a proper vessel is exposed either to hot water or to the vapour of boiling water." This, it is true, is a very imperfect explanation, for it does not indicate the temperature of the hot water or of the steam. But it makes the term applicable to a steam-bath as well as a water-bath, and as we are directed to make extracts in a water-bath, and in making them are told in parts of the processes to boil the liquor, it is obvious that the water or the steam used for this purpose must be hotter than 212°, for water at 212° applied to the outside of the pan will never cause water inside the pan to boil.

The usual practice now is to substitute steam-baths for water-baths; and this is a most important point in connection with the preparation of extracts, for while the process of evaporation may be thus greatly expedited, the difference between the rate of evaporation in a steam-bath, where the steam is under a pressure of from ten to twenty pounds to the inch, and a water-bath, where the temperature of the evaporating liquid never exceeds 200° Fahr., being about as two to one, the heat may at the same time be raised, and often is raised, to a point very injurious to the substances operated upon. This, however, forms part of the subject of evaporation which the time will not admit of my entering into, beyond referring you to the apparatus and arrangements for the preparation of extracts, by spontaneous evaporation, by evaporation *in vacuo*, and by evaporation in the water or steam bath. These different forms of apparatus, which I have long been accustomed to use practically and for lecture illustration, are before you, but I must content myself with stating briefly, that as a Pharmacopœia process, intended for the use of all classes of pharmaceutists, it would be useless, or at least unwise, to order any complicated or expensive arrangements; and I think it has been rightly decided to direct these and similar operations to be effected by the use of the water-bath, although at the same time I think it was a mistake to omit to indicate what the water-bath was intended to be, as the term is often used in an ambiguous sense.

Before I leave the subject of extracts, a word or two must be said with reference to the new forms introduced among them for what are called liquid

extracts, or, more popularly, fluid extracts. These are a class of preparations which have come into extensive use of late years. We have seven of them in the British Pharmacopœia, five of which are new as Pharmacopœia processes. The number of these might perhaps have been extended with advantage, as they are found to be very useful and convenient forms of preparation for many medicines when administered in an aqueous rather than an alcoholic menstruum. While I admit their legitimate use, however, I do not approve of the use of these strong aqueous extractions, in which spirit is also present, for the extemporaneous preparation of infusions, when these are ordered in prescriptions.

Infusa.—In addition to the remark just made, I have but little to say on the subject of infusions. The number has been rather increased. Five old ones are omitted, nine new ones are introduced, one is transferred to liquid extracts, and most of the others are altered, to a greater or less extent. The most important alterations are in the cases of calumba and gentian, and in these I believe we are all agreed that the alterations are not for the better. Infusion of gentian has hitherto been with us one of the most popular of the class of preparations to which it belongs. Made according to the London Pharmacopœia, it may be taken as the type of a good vegetable infusion, possessing the pure bitter of the gentian, the aromatic and slightly astringent bitter of the orange-peel, and the agreeable flavour of the fresh lemon-peel. These all harmonize together, and form at once an elegant preparation, an agreeable bitter, and an efficient tonic. Water surely is the proper menstruum for vegetable infusions, especially of this class. If a stronger and more austere preparation was wanted, made with spirit as well as water, with double the quantity of gentian, and coriander in place of lemon-peel,—a sort of compromise between an infusion and a tincture,—why not have called it by some other name? *Mistura Gentianæ Composita*, for instance, would have done very well, only that that name was previously applied to another preparation. The substitution of this half spirituous, half aqueous mixture for our long and much approved infusion of gentian, is not surely one of the modern improvements in pharmacy. Then, infusion of calumba is now to be made with cold water instead of hot water, a change of very questionable propriety; for although by this means we avoid taking up the starch of the calumba-root, yet by the use of cold water we take up albumen which hot water would render insoluble, and this albumen causes the infusion to become sour and mouldy much sooner than would be the case if the infusion were made with boiling water. But besides this, which may be considered a questionable defect in the new process, there is one respecting which there can be no question. The calumba is ordered "in coarse powder," and if used in that state it makes a complete mess of the infusion. Success in operations of this sort often depends upon very slight modifications in the mode of conducting them, and here there is a great difference between the results obtained in the one case with coarsely powdered calumba, and in the other with calumba bruised or sliced, but entirely free from any powder which makes the infusion thick and muddy.

Linimenta.—We have several changes here. No one will regret the exclusion of Linimentum Æruginis, which, although so-called, contains no verdigris. In the place of this and another rejected liniment, we have several new, and some of them very efficient ones, including linimentum aconiti and linimentum belladonnæ. Several of the old liniments are altered in composition, and among the number is linimentum hydrargyri, for the preparation of which the Dublin process has been substituted for the London. The experience we have had in the keeping of these two liniments while in our collection at the International Exhibition, is favourable to the London preparation,

for this has kept without separation even up to the present time, while the Dublin liniment soon changed, and has undergone complete separation.

Mellita.—Under this head I have only to remark the omission of oxymel of squills, but this old and much used remedy, although turned out of the Pharmacopœia, is not likely to be turned out of use by the public, or even by medical men.

I pass over misturæ, mucilagines, pilulæ, and pulveres, as they present no very tempting subjects for remark, and I shall find more interesting topics among other preparations that follow.

Spiritus.—The whole class of spirits are entirely changed. Spiritus ætheris is certainly a great improvement upon spiritus ætheris compositus, the old Hoffman's anodyne, which, although it has been in the London Pharmacopœia since 1788, has rarely, if ever, been what it was intended or understood to be, in consequence of the difficulty of getting the true oil of wine. The new *Spiritus Ætheris Nitrosi* is no improvement upon its predecessor, but the new spirit of sal volatile is a great improvement upon that previously ordered, and this is now a preparation that will not only satisfy the requirements of the highest medical authority, but will at the same time satisfy the public,—and we could not say so of its predecessor. Spirit of horseradish remains as it was; spirit of camphor is rather weaker than it was; and spirit of chloroform is new to the Pharmacopœia, although it has long been used under the name of chloric ether. All the rest of the spirits, with the exception of proof spirit, may be said to be new to us. They are all solutions of essential oils in rectified spirit, in the proportion of one to nine. They correspond with what we have been accustomed to call essences, and differ entirely from the preparations hitherto used in medicine under the same names. Thus spirit of juniper is ninety-five times stronger than that of the London Pharmacopœia, spirit oj peppermint is forty-seven times stronger, and spirit of rosemary is thirty-one times stronger. The last of these is directed to be made with English oil of rosemary, which cannot be got, for rosemary is not cultivated to a sufficient extent in this country to supply it. Foreign oil of rosemary is said to be largely adulterated with oil of turpentine, or if not, it has a very turpentiny odour; so that between the impossibility of getting the English oil and the difficulty of getting good foreign oil, spirit of rosemary is likely to be at a premium. I disapprove of most of these spirits, and think the changes made are very much for the worse.

Some of the old pharmaceutical spirits may be compared to our distilled waters. They were formerly made by distillation, and usually from herbs or flowers. Thus the process for spirit of rosemary as we formerly had it was a very old one, and the product has been much approved. This was the celebrated Hungary water, the recipe for which is said to be preserved in the Imperial Library at Vienna, accompanied by a certificate in the handwriting of Elizabeth, Queen of Hungary, written in the year 1235. The recipe is as follows:—"Take of aqua vitæ, four times distilled, three parts; rosemary tops and flowers, two parts; put these together in a close vessel, let them stand in a gentle heat for fifty hours, and then distil them."

Of this the Queen of Hungary says, "Being very infirm, and much troubled with the gout, in the seventy-second year of my age, I used for a year this receipt, given me by an ancient hermit, whom I never saw before nor since; and was not only cured, but recovered my strength, and appeared to all so remarkably beautiful, that the King of Poland asked me in marriage, he being a widower and I a widow. I, however, refused him for the love of my Lord Jesus Christ, from one of whose angels I believe I received the remedy."

Now, whatever we may think of this account of the virtues of Hungary water, I should certainly prefer the product to which it refers to the spirit of

rosemary of the new Pharmacopœia. The recipe of 1235, although six hundred years old, may still be taken to represent a good method, if not the best, for the preparation of this class of spirits.

Succi and *Suppositoriæ* are both new as Pharmacopœia preparations. The Succus Taraxaci is understood to be intended as the representative of Liquor Taraxaci, which has long been used in medicine, although not until now recognized in our Pharmacopœias.

Syrupi.—The only one of these to which I can refer is Syrupus Papaveris, for which a new process is given. The syrup made by this process appears to be good, but the process, to say the least of it, is a very awkward one; and it is difficult to understand why this should have been selected in preference to other equally efficient and more manageable and economical processes.

Tincturæ.—Estimated by their number, their strength, and the frequency and extent of their employment, the tinctures are the most important of our Galenical preparations. There are fifty-six tinctures in the British Pharmacopœia, being an increase of three upon those previously recognized by the London College. A glance at the table will show how extensive the changes have been in this department. Nine old tinctures have been omitted; thirteen new ones added; and twenty-one altered in composition, besides alterations of name. But, in addition to these changes, a complete change has been made in the processes by which they are prepared. Some change of process was expected,—indeed, there has been a good deal of speculation among the advocates of the rival processes of maceration and percolation as to which of these processes would receive the sanction implied by its adoption in the National Pharmacopœia. The testimonies in favour of percolation have been so strong and so numerous, that it was hardly doubted by any one that that process would find some fitting applications among the numerous class of tinctures, if it should not even be adopted as a general process; but when the new work came out, all parties were puzzled to know what the prevailing process was. The percolaters would not recognize it as percolation, and the maceraters found in it something more than maceration. There has certainly not been any very general or spontaneous expression of approval of this new process. I believe I may call it new, for I am not aware that this mode of operating has been suggested or described in any publication before its appearance in the British Pharmacopœia. The prevailing opinion has been that it is the result of a compromise,—that the Committee, being unable to agree in the adoption either of percolation or of maceration, took a bit of each, and thus thought they would reconcile both parties. In this process, we are first to macerate the solid ingredients with three-fourths of the spirit for forty-eight hours, with occasional agitation; then we are to transfer the ingredients to a percolator, and when the fluid ceases to pass, to pour in the remaining one-fourth of the spirit, and when this has passed through, we are to subject the contents of the percolator to pressure. Lastly, we are to "filter the product," to mix the two liquids, and to add sufficient spirit to make the whole product up to a specified quantity.

This process is applied to thirty-nine out of the fifty-six tinctures ordered in the Pharmacopœia, and in all those cases it is described in the same terms. The description, however, is rather ambiguous on one or two points. Thus, for instance, it states "as soon as the percolation is completed, *subject the contents of the percolator to pressure;*" but it seems doubtful whether it is intended that pressure should be applied to the ingredients while they are in the percolator, or whether they should be taken out and put into a press. The result, with some of the tinctures, where the solid ingredients are bulky and the displacement consequently imperfect, would vary to some extent according as one or the other of these methods was adopted; in-

deed, it would not be indifferent whether the pressure were effected by an ordinary screw tincture press, or the more powerful hydraulic press, which is now being more generally introduced in pharmaceutical laboratories. Then, after having percolated, as it is called, we are told to "filter the product, and mix the two liquids." I infer from this that only one of the two liquids is to be filtered; but I presume the usual practice would be to filter the whole, after making it up from different sources, to the specified quantity.

There are other imperfections in the description of the processes for some of the tinctures. Thus we are told that aconite root, arnica root, and guaiacum resin are to be used in fine powder; that cochineal is to be in powder; that kino is to be in moderately fine powder; that belladonna leaves, benzoin, cantharides, catechu, cinchona bark, cinnamon, jalap, myrrh, and opium, are to be in coarse powder; that buchu, calumba, capsicum, cardamoms, cascarilla, chiretta, colchicum seeds, hemlock fruit, digitalis, ergot, galls, gentian, hyoscyamus, rhatany, rhubarb, savin, squill, etc., are to be bruised; while castor, saffron, and hop are to be used in their ordinary commercial states.

The practical man looks here, but looks in vain, for some sufficient ground for ordering these ingredients to be used in the states specified. Why are aconite and arnica roots to be in fine powder, while jalap is to be in coarse powder, and calumba, gentian, and rhatany, are to be only bruised? Why is belladonna to be in coarse powder, while digitalis and hyoscyamus are to be only bruised? Why are cochineal and kino to be in powder, while cardamoms, colchicum seeds, ergot of rye, and galls, are to be only bruised? Why are cantharides and catechu to be coarsely powdered, while castor is put in a lump into the spirit and left there without agitation? Can any satisfactory answers be given to these questions? I fear not. In fact, if we look closely and critically into these formulæ, we find, I am sorry to say, a great number of errors, omissions, inconsistencies, call them what you will. I could say something in favour of the new process—half maceration and half displacement—for the preparation of tinctures, and with a little modification I believe it would make a very good process for general use, indeed, I may say the best process that could be adopted. I have forms of apparatus here which I consider to be applicable and suitable for carrying out this process, but as it would be impossible to enter fully into the subject in this lecture, I purpose making it the subject of a paper to be read at our next Pharmaceutical meeting, when it can be freely discussed. But I have no hesitation in saying that the whole of the formulæ for the tinctures ought to be rewritten. We expected that the British Pharmacopœia would represent the existing advanced state of pharmacy in this country, but if this be a representation of our pharmaceutical knowledge, skill, and science, we have been retrograding instead of advancing. Thirty-nine of our tinctures are directed to be made by the new process, and thirteen of the remainder are left to be made by the old process of maceration. Yet I must not say by the *old* process of maceration, for in that we were told to shake up the ingredients from time to time, and this was of the very essence of the process, without which it would not do at all. But now this part of the process is omitted. Take for instance the formula for tincture of castor; it is as follows:—

"Take of, castor one ounce; rectified spirit, one pint; macerate for seven days, strain, express, filter, and add sufficient rectified spirit to make one pint."

These are the instructions given not only in that but in all the other thirteen cases. In the case of the castor, we are to put the unbroken follicles, which in the Materia Medica part of the work are described as about "three

inches long, fig-shaped, firm, and heavy;" these we are to put into the spirit, to macerate for seven days without agitation, and then to strain, etc. This is truly a rough and ready method of making tinctures. But perhaps it may be said that it does not much signify, for the castor is of doubtful efficacy as a medicine, and for the more important tinctures there is the new and improved process for their preparation. Well, let us see how this is. Tincture of opium would surely be considered an important medicine, yet this is ordered to be made by the same defective method of putting the things together and macerating without agitation.

Unguenta.—My time does not admit of my saying much on the subject of the ointments, but I may remark that there appear to be some improvements in this department, although I do not think the process for preparing the lard which forms the basis of some of them is as good as it might have been.

And now, gentlemen, I have come to the end, not of my subject, but, I suspect, of your patience. I have run hastily, as was necessary from the brief time allotted to the purpose, over the several classes of preparations ordered in the British Pharmacopœia; but although I have thus rapidly treated the subject here, I have given to it all the attention and thought I could bestow upon it, and which the importance of the subject demands, in preparing myself for these lectures. The opinions I have formed in studying this work I have expressed here freely and without reserve, believing this to be the course most conducive to the interests of the profession to which I belong, and the body to which I am attached; most in accordance with what would be expected and desired by you, by the medical profession, and even by the Medical Council; and, above all, most consistent with my duty.

ON THE ORGANIC MATERIA MEDICA OF THE BRITISH PHARMACOPŒIA.

Lecture II.

Delivered before the Pharmaceutical Society of Great Britain, on the 23rd of March, 1864.

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I commenced the lecture which I had the honour of delivering in this Institution in February, by describing the object and design of the present Course; and then proceeded to show the increased importance given to the Materia Medica in the British Pharmacopœia over the corresponding portion of any previous Pharmacopœia published in the United Kingdom, which we regarded as a great advance and improvement. We then gave a general sketch of the changes which the Organic Materia Medica of the British Pharmacopœia presented when compared with that of the last editions of the London, Edinburgh, and Dublin Pharmacopœias, and more especially with that of the London, and made some suggestions for its further alteration and improvement; and, lastly, we reviewed in order, those articles of the Materia Medica which appeared to require them, dwelling more particularly upon those that were altogether new to a Pharmacopœia hitherto published in this country, or which were at least new to the limits formerly comprised by the London Pharmacopœia. Our lecture to-day will be devoted to the examination, explanation, and description of the remaining articles of the Organic Materia Medica in the order

in which they are placed in the British Pharmacopœia, or, at least, of those which require such a notice. We commence with—

CONIUM.—"The fresh leaves and branches of wild British plants, gathered when the fruit begins to form; and the leaves dried in the sun, or at a temperature not exceeding 120°," are directed to be employed. It should be noticed that precise directions are here given, as with the other herbaceous plants alluded to in my last lecture, regarding the time of collection and the parts to be used. The leaves and branches are also most properly ordered to be taken from wild plants.*

The leaves are simply described as *tripinnate;* it would have been more precise and distinctive to have said *tripinnate with the leaflets pinnatifid;* or *decompound*, as the lower leaves of the plant are always more divided than the character indicated of them in the British Pharmacopœia.

CUSSO, KUSSO, OR KOUSSO.—This is an article which is entirely new to a Pharmacopœia published in the United Kingdom. It has been likewise introduced into the Secondary List of the Materia Medica of the recently issued United States Pharmacopœia. The plant which yields it is stated in the British Pharmacopœia to be the *Brayera anthelmintica*, De Cand.; but as it was first described and named by Kunth, it should be *Brayera anthelmintica*, Kunth. It belongs to the natural order Rosaceæ. The flowers only are officinal, and are directed to be obtained from Abyssinia.†

The flowers are described as "small, reddish-brown, on hairy stalks, outer limb of calyx five-parted, the segments ovate, reticulated." The segments are however *not ovate*, as thus stated, but *oblong* or *oblong-lanceolate*, as may be seen by the drawing. They have a fragrant balsamic odour; and their taste is at first but slight, although ultimately somewhat acrid and disagreeable.

The flowers have been found to contain a small quantity of a peculiar *volatile oil*, *bitter acrid resin*, two kinds of *tannin*, and a substance called *kwoseine*, and other matters of no importance. The medicinal properties appear to be essentially due to the bitter acrid resin, and doubtless, to some extent, to the volatile oil and tannin. M. Pavesi, and subsequently M. Vée, have obtained a principle from Kousso which they have termed *koussine*, and which they describe as yellow, bitter, and uncrystallizable. Is this the active principle?

Kousso has been in use as an anthelmintic in Abyssinia for more than two centuries, and it is very highly valued in that country. It was introduced into Europe about the year 1847, and when first tried in England, France, Germany, and Switzerland, great expectations were raised as to its valuable medicinal properties. More recent trials, however, do not tend to confirm the extravagant notions then formed, and hence we regard this remedy as still upon its trial, and one which was well worthy of being placed in a Secondary List of the Materia Medica, but scarcely in so prominent a position as it has obtained in the British Pharmacopœia.

The conflicting results which have been experienced from the employment of Kousso are, doubtless, in part due to its varying age when administered, as its properties appear to be sensibly depreciated by keeping. The only officinal preparation is the Infusum, which should be taken in the morning fasting, and the last meal of the previous evening should have been slight. The infusion should not be strained, but the whole stirred up together; and the quantity ordered in the Pharmacopœia (*four fluid ounces*), containing a quarter of an ounce of Kousso, is the ordinary dose for an adult.

DIGITALINUM.—This neutral organic substance, which is said to be the active principle of Digitalis, is another article which has now for the first time obtained a

* Pharm. Journ. vol. v. 2nd ser. pp. 421, 422, 424, and 425.
† For a full account of Kousso, see Pharm. Journ. vol. x. p. 15.

place in the Materia Medica and Preparations of a Pharmacopœia published in the United Kingdom. The process ordered in the Pharmacopœia for its preparation is essentially that of M. Henry, which was itself a simplification of the one originally given by M. Homolle, who first succeeded in isolating this principle, which he termed *digitaline*. The characters given in the Pharmacopœia are quite correct as applied to this substance, but, unfortunately, the authors of the Pharmacopœia appear to have overlooked the more recent memoir of MM. Homolle and Quevenne, in which much new and additional information is given respecting the chemical constituents of digitalis.* In this later memoir they have shown that the proper active principle (*digitaline*), which is intensely bitter, is commonly, as obtained by the ordinary or Pharmacopœia process, mixed with at least two other peculiar neutral principles, which they have respectively named *digitalin*, and *digitalose*. As these are tasteless, and almost, if not entirely inert, they have given a process by which the active *digitaline* may be separated from them, and obtained in a pure state. In this pure condition digitaline is not *white*, as described in the Pharmacopœia, but of a *pale yellow* colour, and in other respects its characters and reactions do not altogether accord with those there given.

It should be further noticed that the term *digitalin* is employed in the Pharmacopœia for the active principle of digitalis, while the original discoverers call this—*digitaline*, and use the former name to designate an inert principle. This is also very unfortunate, and may lead to much confusion, more particularly so as, although the authors of the Pharmacopœia have adopted essentially the process originally given for obtaining, as well as the characters of *digitaline*, by altering the name to *digitalin*, these characters no longer apply to either substance of the discoverers.

The *digitalin* of the British Pharmacopœia is said to be applicable for any purpose to which the leaves of digitalis have been hitherto employed, and to possess the advantage of being more uniform in strength, and hence capable of being administered with more precision and with more certainty of a successful result than digitalis, or the other preparations therefrom. As it is a very poisonous principle, and from its scarcity and high price very liable to be adulterated, we fear that, as far as our present knowledge extends, it cannot be regarded as a valuable introduction to the British Pharmacopœia. The dose of digitalin is from the *one-sixtieth* to about the *one-twentieth of a grain*. The small doses required, and the difficulty of prescribing and adjusting them, are further great impediments to the employment of digitalin as a remedial agent.

Digitalis.—"The dried leaf; from wild indigenous plants, gathered when about two-thirds of the flowers are expanded," is ordered. Nothing is said, as in the last London Pharmacopœia, about the removal of the leaf-stalks and midribs, nor is any preference given to second year's leaves over those of the first year's growth. In the present state of our knowledge of the relative medicinal activity of the different parts of the leaves, and of those of different ages, we think the directions in the Pharmacopœia sufficiently precise.

Among other characters, the leaves are described as "ovate-lanceolate, and shortly petiolate." We should have characterised them as ovate-lanceolate, oblong, or oblong-lanceolate, and petiolate, shortly petiolate, or sessile.

Elaterium.—This is properly described as "a sediment from the expressed juice of the fruit." In the last London Pharmacopœia this sediment was *incorrectly* termed *Extractum Elaterii*, as it is neither an extract nor an inspissated juice in the proper sense in which these terms are employed. In the Preparations and Compounds, Elaterium is very properly directed to be prepared from the nearly ripe fruit, and slight pressure only to be employed in expressing the juice.†

* Bouchardat's 'Archives de Physiologie,' etc., Jan. 1854.
† Prof. Bentley "On Elaterium," Pharm. Journ., vol. i. 2nd ser. p. 323.

ELEMI.—We do not know any sufficient reason why this substance should have been retained in the Pharmacopœia, as it is but little employed, and varies much in its appearance and properties according to its botanical and geographical sources. At present, three kinds of Elemi are more especially known in commerce, namely, Manilla, Brazilian, and Mexican. In the Pharmacopœia, Elemi is described as "a concrete resinous exudation, chiefly imported from Manilla." It is also said that its "botanical source is undetermined, but probably from *Canarium commune*, Linn." Its characters are then stated, but these are certainly *not* those of Manilla Elemi, which is the only kind mentioned, although they would apply very well to the Brazilian Elemi; in fact, the characters of Elemi in the British Pharmacopœia are identical with those given by Professor Guibourt of Brazilian Elemi. If the authors of the Pharmacopœia deemed it desirable to retain elemi, it would have been undoubtedly better to have distinctly directed one kind only to be employed; and as the Manilla sort is that now generally imported, this should be alone made officinal.

FEL BOVINUM PURIFICATUM.—This is an entirely new article of the Pharmacopœia, and as it is occasionally prescribed, although its medicinal properties are by no means evident, it was perhaps desirable to introduce it. It is one of the substances that should be placed in a Secondary List of the Materia Medica. Why Ox Bile was admitted and Pepsine rejected, we are at a loss to conceive.

FICUS.—Among the characters given of this fruit, it is said to contain "numerous small hard seeds." This is botanically incorrect, as they are not seeds at all, but one-celled, one-seeded fruits, resembling achænia. If the term seed-like bodies had been employed, we should scarcely have taken exception to the character in this particular case; but as the fruits of Fennel, Coriander, Anise, Conium, etc., are properly so designated, and not termed, as in common language, *seeds*, it would have been more consistent, and unquestionably more correct, to have adopted a strictly botanical accuracy throughout the Materia Medica of the Pharmacopœia.

FILIX.—The rhizome of this common English fern (*Aspidium Filix-mas*, Swartz), improperly called *fern root*, has been used from an early period as an anthelmintic. It was formerly officinal in the Pharmacopœia of the Edinburgh College, but not in that of the London or Dublin Colleges. It has also been officinal for some time in the United States Pharmacopœia. The class of anthelmintics appears to have found special favour with the authors of the Pharmacopœia, for besides the present substance, three others,—namely, Kousso, Kamela, and Santonin, all of which are entirely new, have been introduced. We regard Fern rhizome as the most valuable of them all, and a very useful introduction to the British Pharmacopœia.

The British Pharmacopœia directs "the dried rhizome; collected in summer," to be employed in the preparation of the Liquid Extract of Fern *Root*, as it is wrongly termed. The rhizome is described as "tufted, scaly, greenish-brown, etc.," but *commercial fern root* is never found in this state, but it consists essentially of portions of the thickened bases of the petioles, to which small fragments of the rhizome with attached rootlets, are found adhering. If the Pharmacopœia directions be followed strictly, the thickened bases of the petioles or leaf-stalks, which constitute by far the greater portion, should be rejected; but in practice this would be found absurd, and, moreover, there does not appear to be any sensible difference between them and the rhizome in their medicinal properties. In another issue of the Pharmacopœia it would be advisable to order the thickened bases of the petioles together with the rhizome to be employed.

JALAP.—The officinal part is described in the British Pharmacopœia in accordance with the more general phraseology as a *tuber*, but strictly and *properly* speaking it is *not a tuber*, which is a kind of subterranean stem or branch, but *a tuberous root* or *tubercule*.

KAMELA.—This is an entirely new article of the Pharmacopœia. It has also been introduced into the Secondary List of the recently issued United States Pharmacopœia, and we regard it as one of those substances, the medicinal properties of which not being thoroughly established, is properly so placed.

The plant from which it is derived is the *Rottlera tinctoria*, Roxb., belonging to the natural order Euphorbiaceæ. The officinal part is the powder which adheres to the capsules. It is imported from India. The plant is widely distributed throughout India, and also occurs in China, North-Eastern Australia, South Arabia, and some other parts of the world. A full account of Kamela, and its origin and properties, by Mr. Daniel Hanbury, will be found in the Pharmaceutical Journal.*

Kamela is a granular powder of a brick-red colour, with but little smell or taste. It readily ignites when thrown into the air directly over the flame of a candle. It is totally insoluble in cold water, and but very sparingly soluble in boiling water. It is readily soluble in a solution of a caustic alkali, and to a great extent, also, in a solution of an alkaline carbonate, also in alcohol, and in ether.

It was chemically examined some years since by Professor Anderson, of Glasgow,† and more recently by Leube.‡ According to Anderson, Kamela contains upwards of 78 per cent. of *resinous colouring matters*, in which he includes a yellow crystalline principle with a satiny lustre, which he has described as a new substance under the name of *Rottlerine*. Leube tried in vain to obtain this principle; and in some other respects his analysis does not agree with that of Professor Anderson. Leube has also described two resins, and he regards the resin which is extracted by ether as the active constituent of Kamela.

Kamela has been long employed in India as a dye for silk, and also for a similar purpose in Arabia, under the name of *Wurrus* or *Waras*.§ In India, Kamela has long had a reputation amongst the natives as a vermifuge, and when externally applied, it is said to be useful in some cutaneous diseases. It is also used internally in leprosy in Aden, and as an external application in solution, to remove freckles and pustules. It has been introduced into the British Pharmacopœia on account of its supposed anthelmintic properties, and although some medical practitioners of repute have found it serviceable, its remedial virtues cannot be said to be at all established.

The dose is from about 30 *grains* to 150 *grains*, suspended in water; or a tincture may be prepared by macerating for two days, *eight ounces* of Kamela in *twenty fluid ounces* of rectified spirit or ether, the latter to be preferred; and then filtering the solution. The dose of this tincture is from *one* to *three fluid drachms* in some aromatic water.

KRAMERIA.—Peruvian Rhatany root, derived from *Krameria triandra*, Ruiz and Pavon, is alone officinal as in former Pharmacopœias. As this kind of Rhatany is scarce, and even at some times scarcely to be obtained, and moreover possesses no advantages over Savanilla or New Granada Rhatany, likewise derived from a species of Krameria, we can see no satisfactory reason why this kind should not have been also made officinal in the British Pharmacopœia.

LAUROCERASUS.—Cherry-Laurel leaves were officinal in the last Edinburgh and Dublin Pharmacopœias, but not in that of the London College. The fresh leaves, from plants cultivated in Britain, are now officinal in the British Pharmacopœia. As the *Aqua Laurocerasi*, the only preparation ordered, is of uncertain strength, being stronger when fresh made or prepared from moderately

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* Pharm. Journ. vol. xvii. p. 405.
† Edinburgh New Philosophical Journal, 1855, p. 296.
‡ Pharm. Journ. 2nd ser. vol. ii. p. 166.
§ Pharm. Journ. vol. xii. pp. 386 and 589.

young leaves; and as its properties depend upon a substance, namely, hydrocyanic acid, for which a definite formula is elsewhere given in the British Pharmacopœia, we regard the introduction of cherry-laurel leaves into the British Pharmacopœia as a mistake.

LINI FARINA.—Linseed meal is a new introduction to the Materia Medica of the British Pharmacopœia as compared with the last London and Dublin Pharmacopœias, but not so as regards the Edinburgh Pharmacopœia. Linseed Poultice was ordered in the last London Pharmacopœia to be prepared with *powdered Linseed*, and hence *it contained the oil;* but the linseed meal, as now ordered, is described as "the seeds ground and *deprived of their oil* by expression." Linseed Poultice was ordered in the last Edinburgh Pharmacopœia to be prepared from linseed meal deprived of the oil, and the reason given by Dr. Christison for its being preferred over the meal containing the oil was, "because the latter, when rancid, is apt to irritate the skin."

In this country and in the United States of America, as a general rule, linseed meal containing the oil has been much preferred for poultices; and for this reason I presume, and also under the impression that olive oil was less liable to become rancid than linseed oil, the authors of the Pharmacopœia have directed Linseed Poultice to be prepared from linseed meal deprived of its own natural oil, but with the addition of *olive oil.* In all the other poultices of the British Pharmacopœia into which linseed meal enters as a constituent, it is used without the oil. Surely this removal of a natural oil, and its replacement by a different one, is a totally unnecessary and useless attempt at refinement.

MATICA, MATICO.—This article of the British Pharmacopœia was introduced originally into the last edition of the Dublin Pharmacopœia, but it was not officinal in the London or Edinburgh Pharmacopœias. It has been likewise introduced into the Primary List of the Materia Medica of the recently-issued United States Pharmacopœia. Matico is the dried leaves of *Artanthe elongata*, Miquel, Natural Order Piperaceæ, and is imported from Peru. I have so recently alluded to this substance in a paper read before this Society, entitled "On a New Kind of Matico,"* that it is unnecessary for me to dwell upon it at present; indeed, my only object in noticing it now is to call your attention to its scarcity,—in fact, a short time since, when my paper was read, it could not be obtained in the British market. Some, however, has been recently imported. This scarcity has chiefly arisen from the great demand for it in North America, in consequence of the war.

MEZEREUM.—Mezereon is now ordered to be obtained from both *Daphne Mezereum*, Linn., the former officinal species, and *Daphne Laureola*, Linn. The experiments of Mr. Squire† show that the latter is inferior in acrimony to the former; but as a portion of the mezereon of commerce is now obtained from it, we presume it was thought desirable to make it officinal. The bark of the root has also been commonly supposed in this country to be stronger than that of the stem, and has hitherto been alone officinal in British Pharmacopœias; but as that is now difficult to procure in sufficient quantity to supply the demand, the authors of the Pharmacopœia have, we think, properly directed the dried bark to be used, without designating the part of the plant from which it is to be taken.

OLEUM AMYGDALÆ.—This oil, which was directed in the last London Pharmacopœia to be expressed either from Sweet or Bitter Almonds, must be, according to the British Pharmacopœia, now expressed from Sweet Almonds alone, as Bitter Almonds are no longer officinal.

OLEUM ANISI.—Oil of Anise is now directed to be distilled from the fruit of *Pimpinella Anisum*, Linn., the Anise, in Europe; and from the fruit of *Illicium Anisatum*, Linn., the Star Anise, in China. The oil from the former has hitherto

* Pharm. Journ. vol. v. 2nd ser. p. 290. † Pharm. Journ. vol. i. p. 395.

been alone officinal, but that of the latter has long been imported into this country and elsewhere, and, so far as our experience goes, it is a superior oil. We are glad, therefore, to find it has been made officinal in the British Pharmacopœia. The characters of the two oils we find to vary, especially as regards their point of congelation, the latter remaining solid at a much higher temperature than the former; hence the characters given in the British Pharmacopœia will not apply indifferently to the two oils, as we should be there led to expect.

Oleum Coriandri.—This, as we have already noticed in our first lecture,* is an entirely new substance in a Pharmacopœia published in the British Islands. It is directed to be used in the preparation of *Syrupus Sennæ.*

Oleum Crotonis.—Two kinds of Croton Oil have been known in this country, namely, that which was imported from India, and hence called East Indian Croton Oil, and that which was expressed in this country from the seeds imported from India, and known as English Croton Oil. The *latter* is now alone officinal, and the following is given as the test:—"Agitated with its own volume of alcohol, and gently heated, it forms a clear solution, from which about three-fourths of the oil separate on cooling." This is a mistake, the framers of the Pharmacopœia having given the test for East Indian Croton Oil instead of that for the English Oil; hence the test is true as regards the former, but is not correct as regards the latter, or officinal oil, which is wholly and readily soluble in alcohol, and the solution thus formed is permanent at ordinary temperatures.

Oleum Cubebæ.—Oleum Myristicæ.—Both these volatile oils are new as compared with the last London Pharmacopœia, but not as regards the Edinburgh and Dublin Pharmacopœias. Both oils are ordered to be distilled in England.

Opium.—We have only one remark to make regarding this very important article of the Materia Medica, and that refers to the characters given of it in the British Pharmacopœia. Thus, among other characters, opium is said to be "enveloped in a poppy leaf, and generally covered with rumex seeds." It should be, *usually* enveloped in poppy leaves, and generally more or less covered by *rumex fruits*, with, rarely, a few rumex seeds intermixed; for some specimens of the kind of opium ordered in the Pharmacopœia are not enveloped in a poppy leaf, and there can be no question here, as in some other cases, whether the parts of the Rumex mentioned are fruits or seeds. Indeed, the few seeds that are found simply arise from accident, for they only occur in those specimens which have been much handled or subjected to friction, in which case the coverings of the capsules become rubbed off and the contained seeds alone left.

Piper.—Black Pepper is stated to be derived "chiefly from the West Indies." This is an error, for no commercial Black Pepper comes from the West Indies; but "chiefly from the *East* Indies." This is the only kind of pepper which is now officinal; long pepper of the old London and Edinburgh Pharmacopœias being no longer retained.

Podophyllum.—Podophylli Resina.—These are both new additions to a Pharmacopœia published in the United Kingdom, but they have been introduced into the United States Pharmacopœia ever since the year 1820, at which period the first Pharmacopœia of that country was issued. The officinal part in the British Pharmacopœia is called the root, although, in reality, it is the rhizome and rootlets. It is imported from North America.†

Podophyllum peltatum belongs to the Natural Order Ranunculaceæ. It is only found in a wild state, in the States of North America, where it is widely spread,

* Pharm. Journ. vol. v. 2nd ser. p. 419.

† For a full account of *Podophyllum peltatum* see an article by Prof. Bentley, "On New American Remedies," Pharm. Journ. vol. iii. 2nd ser. p. 457.

extending from New England to Georgia. The plant may be also commonly seen in the botanic gardens of this and some other countries of Europe.

Podophyllum root or rhizome occurs in pieces of variable length, and from two to four lines thick, averaging about that of a common goose-quill. At intervals, when not too much broken up, it presents large, irregular, more or less flattened tuberosities, from the lower surface of which brownish-coloured rootlets arise, or, when these are detached, their former position is marked by whitish, more or less projecting scars. The pieces are either nearly smooth or much wrinkled longitudinally; of a reddish- blackish- or yellowish-brown colour externally, and internally, whitish or yellowish. They break with a short close fracture; have a sweetish and frequently somewhat narcotic odour; and a nauseous, slightly acrid, bitter, and feebly narcotic taste.

Podophyllum has been frequently analysed, and with somewhat conflicting results. The most important constituents, however, are *two resinous principles*, one of which, according to Lewis, is soluble in alcohol and insoluble in ether, and the other, constituting four-fifths of the whole, is soluble in both alcohol and ether. There is some difference of opinion in North America as to the relative medicinal activity of these two resins, for while Lewis found both to possess purgative properties, the experiments of Mr. Harvey Allen led him to regard the resin which was soluble in both alcohol and ether as alone possessed of any active purgative properties. In the British Pharmacopœia the resin obtained from Podophyllum by means of rectified spirit is officinal; hence, if the presence of two resinous principles be confirmed of different degrees of activity, our Pharmacopœia preparation will contain them both, as they are both soluble in alcohol. Podophyllum resin is described in the British Pharmacopœia to be "almost entirely soluble in pure ether," but we do not find the officinal resin as soluble as there stated. Besides these resinous principles, the alkaloid *berberine*, together with *saponin*, and another alkaloid, have been recently discovered by Mayer in Podophyllum.*

In America, podophyllum rhizome and its preparations, and more especially that of the resin under the name of *podophyllin*, have long established their reputation as active and certain cathartics. Podophyllin has also been very extensively employed for some years in this country and in other parts of the world, and is now, by almost universal testimony, regarded as a most valuable cathartic and cholagogue. In many cases it is applicable with perfect safety where mercury has been hitherto indicated and alone used. The griping effects which are frequently experienced by its use may be readily prevented by combining it with small doses of extract of henbane. The dose of podophyllum resin of the British Pharmacopœia is from *a quarter* to *half a grain*, or even, in some cases, *a grain*. There can be no doubt but that Podophyllum is a very valuable addition to our British Pharmacopœia; indeed, we have no hesitation in stating that it is by far the most important new remedial agent introduced into that volume.

Quiniæ Sulphas.—This very valuable remedial agent is now termed *Sulphate of Quinia* instead of *Disulphate of Quina* as in the last London Pharmacopœia. In the Materia Medica it is stated to be the sulphate of an alkaloid prepared from Yellow Cinchona Bark, and the bark of *Cinchona lancifolia*, Mutis; hence we should have naturally concluded that the authors of the Pharmacopœia intended it to be prepared from both these barks, but upon referring to the Preparations in another part of the volume, we find only Yellow Cinchona Bark ordered, and as under that name in the Materia Medica, only one kind of bark is alluded to, namely, that derived from the *Cinchona Calisaya*, Weddell, we presume that the authors of the Pharmacopœia intended it to be alone employed in

* Pharm. Journ. vol. iv. 2nd ser. p. 517.

the preparation of Sulphate of Quinia. There is some inconsistency here between the Materia Medica and the part treating of the Preparations and Compounds.

ROSA CANINA.—"The ripe fruit of indigenous plants, deprived of the hairy seeds (achenes)," is ordered in the British Pharmacopœia. We have to remark here that the term *achenes* is wrongly applied to seeds, as an achenium is a kind of fruit,—that is, a pericarp with an enclosed seed; moreover, the parts here called seeds are really fruits, and hence, if the authors of the Pharmacopœia had said the ripe fruit of indigenous plants, deprived of the hairy carpels (achenes), no exception could have been taken.

ROSA CENTIFOLIA.—ROSA GALLICA.—The fresh petals of the former, fully expanded, from plants cultivated in Britain; and the fresh and dried unexpanded petals of the latter, also, from plants cultivated in Britain, are officinal. Those of the former are properly termed Cabbage-Rose petals, and petals of the hundred-leaved Rose; and those of the latter, Red-Rose petals. We notice these roses because mistakes have often occurred from the *Rosa gallica* being called at Mitcham and elsewhere, where it is cultivated, the Damask Rose, and the petals are frequently ordered and sold under that name; but, properly speaking, the Damask Rose is the *Rosa centifolia*, or, at least, a nearly allied species or variety of that plant. To avoid any confusion, it is to be desired that the names by which the two roses are alluded to in the British Pharmacopœia should be alone employed.

SABADILLA.—Cevadilla is new as a distinct article of the Materia Medica to the present British Pharmacopœia as compared with the last published London Pharmacopœia, although it was formerly officinal in the London Pharmacopœia of 1836. It was also officinal in the last Edinburgh Pharmacopœia, but not in that of the Dublin College. The officinal part is the dried fruit; which is said to be imported from Vera Cruz and Mexico. In the former London Pharmacopœia of 1836 the seeds were alone officinal; but as the Cevadilla of commerce always consists of the mixed fruits, pericarps, and seeds, and as the separation of the latter is a tedious process, the authors of the Pharmacopœia have now made the fruit, that is the pericarp with the enclosed seeds, officinal. Cevadilla has been placed in the Pharmacopœia solely for the purpose of being employed in the preparation of Veratria. As Veratria is only found in the seeds, it would be desirable to endeavour to get them alone imported, and they could then be made officinal.

Some differences of opinion have arisen amongst botanists and pharmacologists as to the source of Cevadilla. In the last Edinburgh Pharmacopœia it was referred to *Veratrum Sabadilla*, Retzius, *Helonias officinalis*, Don, and probably other Melanthaceæ; in the recently-issued United States Pharmacopœia it has also been referred to the *Veratrum Sabadilla*, Retz.; while in our present British Pharmacopœia the *Asagræa officinalis*, Lind., is given as its source. Pereira states that he had never met with the fruit and seeds of *Veratrum Sabadilla*, Retz., in England. So far as our experience goes, also, we find Cevadilla tolerably uniform in its characters, which accord with those presented by the fruits and seeds of *Asagræa officinalis;* and hence we regard the latter plant, as stated in the British Pharmacopœia, to be the one from which it is derived.

SAMBUCUS.—Fresh Elder-flowers, obtained from indigenous plants, are alone officinal. The characters given of them in the British Pharmacopœia are:—"Flowers small, white, fragrant, crowded in large cymes." In commerce the flowers are never seen in cymes as stated in the Pharmacopœia, but separated from the stalks, and hence the cymose character would then be valueless. The other characters which are given are also entirely useless by themselves as distinctive peculiarities of Elder-flowers, as they might with equal propriety be applied to numerous other common flowers.

It was evidently the intention of the authors of the Pharmacopœia that Elder-

flowers should be supplied before being separated from their stalks, and hence they ought now to be obtained in cymes as gathered from the plant, and then the characters given in the Pharmacopœia would apply. The only officinal preparation now ordered is the Aqua Sambuci, the Unguentum having been rejected.

SANTONICA.—SANTONINUM.—Both these articles are new as compared with the last published editions of the Pharmacopœias of London, Edinburgh, and Dublin, but Santonica was formerly officinal in the Dublin Pharmacopœia, but was discarded in that issued in 1850. Santonica has also been introduced into the Primary List of the Materia Medica, and Santonin among the Preparations of the recently-issued United States Pharmacopœia. In the British Pharmacopœia Santonin is described as the unexpanded *flower-heads* of an undetermined species of *Artemisia*, Linn.; and is stated to be imported from Russia. The test given is as follows:—"Flower-heads not round or hairy." In commerce they are commonly designated as seeds; but they are correctly stated in the British Pharmacopœia to be the unexpanded flower-heads. With these flower-heads we commonly find in commercial santonica a variable proportion of stalks intermixed.

Santonica has been known under several names, as *Wormseed*, *Semen Santonici*, *Semen contra*, *Semen cynæ*, etc. Three sorts have been described by pharmacologists, under the respective names of Levant Wormseed, Barbary Wormseed, and Indian or East Indian Wormseed. The two latter much resemble each other, except in colour, and may be readily distinguished from the former by being covered with a whitish down. The former, or Levant Wormseed, is that most frequently met with in England, and is moreover the best kind. It is this sort only which is officinal. It is said to be the produce of Bucharia, Persia, etc.; it comes to England by way of Russia. It is this kind also which has been made officinal in the United States Pharmacopœia. Its botanical source, as stated in the British Pharmacopœia, is undetermined, but it is supposed by some writers to be principally derived from *Artemisia Contra*, Linn.

Santonica flowers have been several times analysed, and with somewhat different results. Their most important constituents are, undoubtedly, a *volatile oil* and a *crystalline neutral principle*, termed *santonin*. The latter is now commonly regarded as the active principle, and has been made officinal in the British and United States Pharmacopœias; but some of the medicinal activity of Santonica is doubtless due to the volatile oil, and hence Santonin will not altogether in every case supply the place of Santonica. Although Santonin is neutral in its action upon test-papers, it forms crystallizable and soluble salts with the alkalies.

Santonica has been long employed in Europe as an anthelmintic, and also, to some extent, for a similar purpose, in North America. The dose of Santonica is from *twenty* to *sixty grains*, which should be repeated morning and evening for about three days, and then followed by some active cathartic. The active principle, *Santonin*, being nearly tasteless, is commonly preferred to the flowers, which are moreover too bulky for general administration; its dose for a child is is *about half a grain* twice a day, and for an adult from *two* to *five grains*. It is best administered dissolved in castor oil. Santonin should be given with care, as otherwise it might produce very injurious effects. The anthelmintic properties of both Santonica and Santonin have been so commonly testified to by practitioners of repute in various parts of the world that we can but regard them as useful introductions to the British Pharmacopœia.

SCAMMONIÆ RADIX.—This is an entirely new substance in a Pharmacopœia published in the United Kingdom. It is introduced solely for use in the preparation of Resina Scammoniæ. In the British Pharmacopœia "the dried root; *from Syria*," is ordered. It would have been more correct to have said *from Asia Minor* and *Syria*, for although the Scammony plant may be found in Syria, its principal habitat, as well as commercial source, is Asia Minor. At the present time there is some difficulty in obtaining a regular supply of Scammony root, and nearly, if not the whole of it in this country is, we believe, in the hands of one or

two importers. This irregularity in the supply will however, we trust, be but temporary, although we anticipate that there will be, for some time at least, a difficulty in obtaining a regular supply of roots. The roots will also be found to vary much in the amount of resin they yield according to their period of collection. This fact, combined with the probable difficulty of obtaining regular supplies, are to some extent drawbacks to the introduction of Scammony root into the Pharmacopœia, although, on the whole, we regard its admission as a useful one.

SCAMMONIÆ RESINA.—This is an entirely new article, so far as its preparation from Scammony root is concerned, in a British Pharmacopœia; but the resin obtained from ordinary Scammony of commerce was officinal in the last Edinburgh Pharmacopœia. In the present British Pharmacopœia it is stated to be "a resin, obtained by means of rectified spirit from Scammony root or Scammony." Hence this direction would leave it optional with those who prepare the resin to use the root or ordinary Scammony of commerce. Among the characters given of the resin, it is also stated to be of a sweet fragrant odour if prepared from the root; and moreover, under the head of Scammony in the Materia Medica, one of the preparations mentioned is the Resina. We should naturally conclude, therefore, that either substance might be indifferently used for the purpose; but upon turning to Scammoniæ Resina in the Preparations and Compounds, (which by some mistake is translated Resin of Jalap,) we find a formula for its preparation, in which no notice is taken of commercial Scammony, but *Scammony root is alone ordered* to be employed. With such conflicting directions, we are necessarily unable to say whether Scammony root, or commercial Scammony, or both are intended to be used indiscriminately. It is quite clear, however, from the introduction of Scammony root into the Pharmacopœia, solely for the purpose of preparing the resin, that the authors of that work evidently intended it to be one of the articles employed. It would have been perhaps better to have directed the root only to be used, as the characters of the resin obtained indifferently from it and commercial Scammony will vary much in their characters. There is one advantage, however, of retaining commercial Scammony as one of the sources of the resin, for now, in case of a deficiency of the root, we can fall back upon it.

Scammony resin prepared directly from the root was introduced to the notice of the medical profession about five years since, in consequence of the great and systematic adulteration to which commercial Scammony was subjected,* and the matter was brought before this Society by Dr. Garrod. From the experiments of Drs. Garrod, Frederick J. Farre, George Johnson, and others, it appears that this resin is quite equal as a remedy to the best virgin Scammony of commerce, and that it possesses the most important advantages of "being perfectly uniform in its physical characters, composition, and therapeutic action." We are informed also, on the best authority, that Scammony resin prepared from the root, may be sold at three-fourths the price of the best virgin Scammony. With such testimony, however much we might be inclined otherwise to doubt the equal efficiency of a direct exudation derived by incision from a living root and a product obtained in the laboratory, we cannot but regard it as a useful introduction to the British Pharmacopœia.

SCAMMONIUM.—This, the old Scammony of our Pharmacopœias, is stated to be "a gum-resin, obtained by incision from the living root in Syria." This is not altogether correct, for but very little Scammony comes to us by way of, or is obtained in, Syria; and even the little which we do thus obtain is of very inferior quality. All our best Scammony is obtained in Asia Minor, and principally in the northern and north-western parts, and hence in those most remote from Syria.

Among the preparations of Scammony, and Resin of Scammony, under these respective heads in the Materia Medica, we find that either substance may be

* Pharm. Journ. vol. xviii. pp. 446 and 543.

indifferently used for the Confectio, Extractum Colocynthidis Compositum, and Mistura; but under the head of Mistura in the Preparations we see that Scammony Resin is alone ordered. We must leave the authors of the Pharmacopœia to explain this inconsistency.

SENNA ALEXANDRINA.—SENNA INDICA.—It should be noticed that Alexandrian Senna and the kind called Tinnivelly are alone officinal in the British Pharmacopœia, and are directed to be used indifferently in the preparations of that drug. The old sort of East Indian Senna should be, therefore, no longer employed. Alexandrian Senna is stated to be derived from *Cassia lanceolata*, Lamarck; and *Cassia obovata*, Colladon. Tinnivelly Senna is referred to *Cassia elongata*, Lemaire.

TARAXACUM.—"The fresh roots; gathered between September and February," are ordered, and in the list of preparations directed to be made therefrom, as enumerated in the Materia Medica, we find the Decoctum, Extractum, and Succus. Upon turning to these separate preparations, we observe that somewhat different directions are then given; thus, for the Succus, dandelion root is simply ordered; for the Extractum, *fresh* dandelion root; and for the Decoctum, *dried* dandelion root. We are again at a loss to understand these discrepancies between the Materia Medica and the Preparations and Compounds. In another issue of the British Pharmacopœia it will not only be desirable to order *dried roots* as well as *fresh* in the Materia Medica, but absolutely necessary if the Decoctum is to be retained; for otherwise this preparation can only be prepared according to the Pharmacopœia directions at certain seasons, which would be absurd.*

The best time for collecting Dandelion roots for use in medicine has been repeatedly alluded to in papers published in the Pharmaceutical Journal, and the opinion which I have frequently publicly stated, remains unchanged; namely, that the roots are most active at the end of February or beginning of March.† According to the directions given in the British Pharmacopœia, Dandelion roots may be collected any time between September and February. It is clearly a mistake, however, to order them to be obtained in the winter months, as frost has a manifest effect upon their activity. Next to the time I have indicated, I believe the best period to be from the middle of October to the middle or end of November.

TRAGACANTHA.—Tragacanth is said to be a gummy exudation from the stem of *Astragalus verus*, Olivier; and possibly other species. On the table is a specimen of *Astragalus gummifer*, brought from Syria by Mr. Daniel Hanbury, and now in the Museum of the Pharmaceutical Society, on which gum tragacanth may be seen concreted on the surface of the stem. The tragacanth of this plant does not, however, appear to be found in commerce; although there can be but little doubt that commercial Tragacanth is derived from more than one species of *Astragalus*; but what those species are is, at present, doubtful. Tragacanth is stated in the British Pharmacopœia to be a gummy exudation from the stem; but the best flaky Tragacanth is not a spontaneous exudation, as would be inferred from the Pharmacopœia, but the gum which flows from the stem after incision, as any one may convince himself by examining the fine specimen of flaky Tragacanth *in situ* which is upon the table.‡

ULMUS.—"The dried *inner bark*, deprived of its outer layers; from trees indigenous to, and cultivated in Britain," is ordered in the Pharmacopœia. We presume that the *bark* deprived of its outer layers is intended, and that the whole of the inner bark should be used.

Only one preparation of Elm Bark is mentioned in the Materia Medica, namely, the *Decoctum;* but no such preparation, or any other, so far as we can

* Prof. Bentley, "On the Characters of Dandelion Root," Pharm. Journ. vol. xvi. p. 304.
† Pharm. Journ. vol. xiv. p. 260, and vol. i. 2nd ser. p. 402.
‡ Journ. de Pharm. et de Chimie, Feb. 1856, p. 117, and Feb. 1857, p. 149; Pharm. Journ. vol. xv. p. 18.

ascertain, is to be found among the Preparations and Compounds. Hence, here we have a substance placed in the Materia Medica solely on account of its preparation, which preparation is afterwards omitted. This is another of the many illustrations which the British Pharmacopœia presents of the discrepancies which exist between the Materia Medica and the part treating of the Preparations and Compounds.

We have now finished our critical and explanatory notices of the articles of the Organic Materia Medica of the British Pharmacopœia, and we trust that throughout our lectures we have kept prominently in view the remarks we made at their commencement, which were as follows:—When we consider the great difficulties that the framers of this national work have had to encounter, I feel sure that you will all agree with me, that whatever errors it may contain and whatever its shortcomings may be, we should make all reasonable allowances for them, and approach its consideration and critical examination in a philosophic and friendly spirit, and with an anxious desire of finding out its merits rather than its defects. At the same time, it is imperatively necessary that a work of so much importance, one of constant reference and study, and one upon the right interpretation of which will frequently depend the issues of life or death, should be thoroughly and critically examined,—not only for the purpose of preventing any present inconvenience and danger, but also as a guide to the framers of subsequent editions.

In the spirit thus alluded to, and with the object of doing something to the future improvement and development of the British Pharmacopœia, we have endeavoured to discharge the duty required of us by the Council of the Pharmaceutical Society; and in taking our leave of the Organic Materia Medica, we can only repeat what we stated at the conclusion of our last lecture, that although it is certainly not a perfect work, upon the whole it has been well done, and is a great improvement upon the corresponding portion of any previous Pharmacopœia published in the United Kingdom.

BRITISH PHARMACEUTICAL CONFERENCE.

The annual meeting of the members of the British Pharmaceutical Conference—which, it will be remembered, is an organization chiefly for the encouragement of scientific inquiry into matters connected with pharmacy—will be held at Bath this year, at the time of the visit of the British Association to that city. Of the subjects suggested for investigation the following have been accepted, either by the gentlemen who proposed them or by other members, and a paper on each question (or an abstract of the paper if the author shall have previously published his results) will be read at the meeting:—

Extract of *Fucus vesiculosus* is occasionally prescribed for use in medicine. When made by the action of proof-spirit, a green product is obtained; when by water, a red extract results. What is the most eligible form in which to exhibit any medicinal principles that may be present in the plant? Accepted by J. WHITFIELD.

Valerianate of Zinc. Describe an easy method of determining the purity of this salt as found in commerce. Accepted by F. SUTTON.

Valerianate of Iron. What is the best process for the preparation of this salt? What are its characters, and how may its purity be most readily ascertained? Accepted by F. SUTTON.

Syrup of Senna. Devise a formula for this preparation which shall afford a syrup less prone to ferment than that of the London Pharmacopœia. Accepted by J. A. KNIGHTS.

Methylated Spirit. Required, an easy method of detecting methylic alcohol in the presence of ethylic alcohol. Accepted by J. TUCK.

To what extent is dialysis applicable in determining the nature of the crystalline constituents of plants? Accepted by J. ATTFIELD.

Report on the applications of Glycerine in Pharmacy. Accepted by F. B. BENGER.

What is the quality of the diluted solution of Phosphoric Acid met with in commerce, and what the best and safest method of obtaining it of constant strength? Accepted by R. PARKINSON.

Ergot. What is its active principle, and what the best preparation for its administration? Accepted by R. V. Tuson.

Cusparine. Mr. Haselden undertakes to make a communication on this subject.

Euphorbine. Professor Tuson will add to some experiments he has already made on this substance, and report the result to the Conference.

Hyoscyamine. Mr. Tilden engages to add to our knowledge of this alkaloid.

Pereirine. Dr. C. A. Martius will communicate a paper on this body.

Some of the pill-masses of the Pharmacopœia are of inconvenient consistence, or acquire that condition by keeping; can this be obviated? Accepted by E. Wood.

Concentrated Infusions. Required, processes which will yield stable products that give on dilution infusions resembling those of the Pharmacopœia, and which can be conducted with facility on the small scale. Accepted by T. Grundy.

Podophyllin. What is the nature of the commercial article, and what process will yield a definite substance? Accepted by J. Spearing.

Report on processes for the separation and estimation of alkaloids in medicinal extracts, etc. Accepted by T. B. Groves.

Report on the modes of preventing the rancidity of medicinal fats. Accepted by T. B. Groves.

Report on the weights and measures used in pharmacy. Accepted by B. S. Proctor.

On microscopic analysis applied to pharmacy. Accepted by H. Deane and H. B. Brady.

To what does Senna owe its active properties, and what is the best solvent of the same? What is the comparative medicinal value of senna-leaflets and senna-pods? Accepted by J. A. Knights.

What is the quantity of Tannin in English Galls (*Cynips Quercus-petioli*) at different stages of their growth? Can they at either of these periods be employed economically as a substitute for the nut-galls of commerce? Accepted by W. Judd.

Steel Wine. What is the best method of obtaining this preparation of uniform strength and appearance, and what the quality of commercial specimens? Accepted by F. Sutton.

Potentilla Tormentilla. Mr. Adams will send a paper on this drug.

Subjects relating to Adulterations, Impurities, and Faults of Manufacture.

Iodide of Potassium. A large quantity of this salt is now imported from the Continent; what is its condition as to purity? Accepted by F. C. Clayton.

Carbonate of Bismuth of commerce is said to contain a large proportion of nitrate; what is the general composition of this article, and what the best method of its preparation in the pure state? Accepted by C. Umney.

Large quantities of cotton-seed oil are expressed in this country, and exported to Italy for admixture with olive oil. What are the properties of cotton-seed oil, and can it be used in pharmacy? Accepted by R. Reynolds.

Essential oils, their adulterations by turpentine, and tests of purity. Accepted by H. S. Evans.

Report on the purity of the simple and compound powders used in medicine. Accepted by F. M. Rimmington.

Report on the strength of diluted and undiluted officinal acids. Accepted by S. Paine.

Report on the strength of the alkaline solutions (Potash, Ammonia, etc.) met with in pharmacy. Accepted by S. Paine.

Report on the various James's Powders. Accepted by W. T. Fewtrell.

The composition of the bottled mineral waters of commerce. Accepted by H. Matthews.

On the Calamine and Oxide of Zinc of pharmacy. Accepted by R. H. Davis.

Report on the purity of commercial iodides and bromides, other than the iodide of potassium. Accepted by H. Matthews.

Report on the strength and condition of such mercurial preparations as mercury with chalk, mercurial ointment, etc. Accepted by J. Coupland.

Report on the purity of Sulphate of Quinine of commerce. Accepted by W. W. Stoddart.

Reports on the strength of tinctures as met with in pharmacy. Accepted by W. D. Savage.

On the quantity of alkaloid in various specimens of citrate of iron and quinine. Accepted by T. B. GROVES.

The Morphia salts of commerce. What is their state of hydration and moisture? Does the hydrochlorate often contain codeia? Accepted by W. E. HEATHFIELD.

A Committee of five gentlemen—Dr. Attfield, of London; Mr. T. B. Groves, of Weymouth; Mr. B. S. Proctor, of Grey Street, Newcastle; Mr. F. M. Rimmington, of Bradford; and Mr. F. Sutton, of Bank Plain, Norwich—has the general charge of these subjects relating to the purity of medicines. Either member of the Committee will be glad to receive directly, or through the General Secretaries, authentic specimens of substances whose examination would tend to throw light on the questions. The analysis of such specimens will be free of cost.

Every member of the British Pharmaceutical Conference is expected to suggest subjects for investigation, or to work upon subjects suggested by himself or by others, or to contribute information tending to throw light on questions relating to adulterations and impurities, or to collect and forward specimens whose examination would afford similar information, *or in some other way to aid in the advancement of pharmacy.* Any new facts that are discovered during an investigation may be at once published by an author at any meeting of a scientific society, or in any scientific journal, or in any other way he may desire. He is expected, however, to send a short report on the subject to the annual meeting.

The current list of subjects requiring investigation is sent to members immediately after their election, and a new list immediately after every annual meeting. The list for 1863-64, containing several questions at present unaccepted, can be obtained of either of the Honorary General Secretaries—Dr. Attfield, 17, Bloomsbury Square, London, W.C., and Mr. R. Reynolds, F.C.S., 13, Briggate, Leeds; or of the Local Secretary, Mr. J. C. Pooley, George Street, Bath.

The annual meetings will probably be held at the time and place of the visit of the British Association.

Gentlemen desiring to join the Conference must be nominated by two Members. The yearly subscription is five shillings, due in advance, on the 1st of July.

The 'Lancet' of March 5, 1864, in a leading article relating to the British Pharmaceutical Conference, says:—"The utility of this movement is very obvious, and we hope that the results attained may be commensurate with the energy and ambitious range of research with which the inquiry is inaugurated. In view of this extensive series of investigations, and of the temporary derangement produced by the many changes, additions, and errors of the new Pharmacopœia, we shall suspend the operations of our Analytical Sanitary Commission."

MEETING AT BATH, MARCH 5, 1864.

A committee to consider the subject of the prevention of accidental poisoning has been formed. It is under the sanction and recognition of the British Pharmaceutical Conference, and is composed of Mr. J. R. King, of High Street, Bath; Mr. J. H. Marsh, of Milsom Street, Bath; and Mr. F. W. Kent, of Saville Row, Bath, either of whom will gladly receive suggestions on the subject. Such suggestions will be reported to a future meeting of the Committee, with the view of preparing a practical paper, to be read at the annual general meeting.

ORIGINAL AND EXTRACTED ARTICLES.

ON WRIGHTINE; AN ALKALOID CONTAINED IN THE SEEDS OF *WRIGHTIA ANTIDYSENTERICA.*

BY JOHN STENHOUSE, LL.D., F.R.S.

The *Nerium antidysentericum* of Linnæus, *Wrightia antidysenterica* of Robert Brown and modern botanists, is a tree belonging to the order *Apocynaceæ*, indigenous to various parts of India, and occurring also in Ceylon. Under the name of *Conessi Bark*, or the Malay name of *Codago-pala*, its bark was intro-

duced into Europe about the middle of the last century as a valuable remedy in dysentery, diarrhœa, and fever, but it apparently soon fell into disuse, and is now almost forgotten. In India, however, it still maintains its reputation, at least among the native physicians. The seeds of the tree, called in Hindustanee *Inderjow*, and in Arabic *Lissan al asafeer* (literally, birds' tongues), are reputed to resemble the bark in their medicinal properties. Mr. Waring, of Travancore, in a recent essay "On the Principal Indigenous Tonics of India," states that Wrightia seeds are reckoned serviceable in dysentery, diarrhœa, fevers, flatulence, bilious affections, etc. In the treatment of hæmorrhoids they are given in the form of decoction made with milk, and regarded as most efficacious.

I am indebted to Mr. Daniel Hanbury for the above description, and also for a quantity of the seeds.

The seeds, which contain a large quantity of a fixed oil, were reduced to a coarse powder by pounding,—an operation which is accomplished with some difficulty, owing to their greasy nature. The pounded seeds were then placed in a displacement apparatus and treated with a considerable quantity of cold bisulphide of carbon, in order to remove the fatty matter. The seeds were then heated in an open vessel until the mechanically-contained bisulphide of carbon was driven off, and they were afterwards extracted with boiling spirit of wine. The fatty matter which is extracted by bisulphide of carbon from *Wrightia seeds*, and which is present in large quantity, is a fixed oil, which does not solidify at a temperature considerably below 32° F. When digested with caustic alkalies it is slowly decomposed, giving a solution of soap, from which acids precipitate a fat becoming semisolid when cold.

After the alcohol had been removed by distillation from the alcoholic extract of the seeds, prepared in the manner described, the residue, which consisted chiefly of crude Wrightine, contaminated however with fatty matters, gum, etc., was digested with a small quantity of dilute hydrochloric acid, and filtered. The clear solution, if tolerably concentrated, when treated with ammonia or carbonate of soda, yielded an abundant flocculent precipitate, the solution at the same time becoming of a deep green colour. The Wrightine was collected on a filter and washed with cold water. When ignited with soda-lime it evolves alkaline vapours and a basic oil, which solidifies to a resin on cooling.

Wrightine is moderately soluble in boiling water and in boiling spirit of wine, and but slightly so in ether or bisulphide of carbon. I have not succeeded in obtaining it, or any of its salts, in a crystalline state.

Wrightine readily dissolves in dilute sulphuric, nitric, hydrochloric, oxalic, or acetic acids; but the solutions, however highly concentrated, only yield a resinous deposit, without the slightest trace of crystallization.

Both Wrightine and its salts have an extremely persistent bitter taste.

When digested with strong nitric acid it readily dissolves, giving off red fumes, and becoming oxidized into oxalic acid without the formation of any picric or similar acid.

Decoction of galls produces an abundant flocculent precipitate in a solution of Wrightine, in acetic acid; this precipitate is soluble in hydrochloric acid.

Bichloride of platinum in solutions of Wrightine in hydrochloric acid, gives a pale yellow precipitate, which is not crystalline.

Terchloride of gold a similar precipitate, only of a somewhat paler colour.

Perchloride of mercury in solutions of Wrightine produces an abundant white flocculent precipitate. When the pounded seeds are boiled for some time with very dilute sulphuric acid, and rapidly filtered through a bag filter, the solution deposits on cooling a flocculent precipitate, which is difficult to collect, as it soon stops up the pores of the filter. On heating this precipitate after it has been freed from sulphuric acid by washing with cold water, it chars and burns, evolving an odour similar to that of burnt starch.

It is insoluble in spirit of wine, but soluble in dilute sulphuric acid, from which it again separates on cooling.

FURTHER REMARKS ON THE COHESION FIGURES OF LIQUIDS.

BY CHARLES TOMLINSON.

Lecturer on Science, King's College School, London.

A wish having been expressed that some of the diagrams of cohesion figures, exhibited during the reading of my paper on the 3rd of February last, should be reduced and engraved on wood for insertion in the Journal, I think it due to the Society to make a few additional remarks in connection with these figures, which, as now presented, bear about the same relation to the originals as an engraving of a rainbow does to the real object. But although the exquisite beauty and harmony of colour of some of these figures is thereby lost, yet a certain rough idea is thus given of their form and outline, so that any one working on this subject for the first time may get a notion of the kind of form he has to expect.

After the reading of my paper, a number of questions were put as to the variation of the figure by changing the surface, etc., and I stated that water seems, in all respects, to be best adapted for the exhibition of these figures. In a paper published in the 'Philosophical Magazine' for March, 1862, some particulars are stated respecting variations in the figures arising from changes in the adhesion surface. Thus, a drop of water gently delivered to the surface of sulphuric acid from the end of a pipette, flattens down into a well-defined disk about the size of a shilling, marked with radial lines; these disappear at the centre, while fragments remain for some seconds, near the circumference. Alcohol, ether, benzole, etc., on sulphuric acid give striking figures, showing how remarkable is the change when the adhesive force of the surface is varied by the substitution of some other liquid for water.

When acetic acid is used as the adhesive surface, a new set of figures is obtained. Thus oil of camphor, which on water forms a large well-developed film, produces only a small disk on acetic acid (sp. gr. 1·045), which disk sails about with considerable agitation, throwing off numerous globules. Oil of lavender also forms a small disk, which gathers itself up with strange contortions, and illustrates in its own way the struggle that is going on between cohesion and adhesion.

A question was also asked respecting cod-liver oil, when I stated that a specimen (A), supplied to me as pure, gave a certain figure; that a specimen (B) purchased at a shop gave another figure; but that on mixing two-thirds of common fish oil with one-third of A, I obtained a figure almost identical with that given by B.

The first in the accompanying page of engravings is a portion of the figure of castor oil. Of course it will be understood that all these figures are complete disks or circles, of which portions only are here represented. They are produced on the surface of water contained in a shallow glass about four inches in diameter.* The following experiments were made on the 10th and 11th of

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* I have lately ordered a number of glasses resembling large claret-glasses; each glass stands on a wide foot, and the stem is rather long, for the convenience of handling; so that the hand need never be brought into contact with the inner surface of the glass. After an experiment, a jet of water from a tap will often get rid of all traces of the oil of a former experiment. Should it not do so, the caustic potash solution must be used, and should this fail, sulphuric acid must be resorted to. A glass is left at the Society's house, for inspection by members.

March in these new glasses. They were not made under very favourable circumstances, as the temperature of the room was under 50°; whereas it should not have been less than about 60°. Two specimens of East India castor oil supplied by an importer were tried. The first, a colourless, viscid oil, gave a good figure, though small, probably due to the low temperature. The second, which had a slight tinge of brown, gave a good figure, rather larger than the first. Two other oils from the same house also furnished capital figures.

Three other specimens were furnished by Messrs. Baiss, Brothers. The first, East Indian, a bland, viscid, colourless oil, produced an admirable figure. The second, Italian, prepared "from the finest decorticated seeds," was a sweet, bland oil, and gave even a still finer figure, the coloured rings being very persistent. The third, which has been in my possession nearly three years, and produced the figure from which my description and large diagram were taken, is still as good as ever. An oil, bought about the same time at a druggist's, produced a figure by no means so good; it did not open so freely, nor were the colours so bright as with the finest oils, but the residual figure was good, and I am not able to say but that it was a pure oil.

A specimen from the Jamaica Court of the International Exhibition was of a yellow-brownish colour; the taste rather acrid. The coloured rings of the figure were finer than in the former specimens, but the lace-like border was not so well developed, and the perforations were smaller.

Another specimen from the Italian Court of the International Exhibition, gave an admirable figure; it opened well with very persistent colours. The silvery corona also opened into innumerable small well-shaped circular holes before the lace-like pattern was developed. The outer coloured rings were also perforated.

A specimen from the India Museum, a colourless oil, gave an exquisite figure: another, from the same source, an opaque specimen of a yellowish colour, gave a very small figure, only about half the usual size; the residual figure was not like that of the other specimens, and it soon gathered itself up into a small disk.

I am not sufficiently acquainted with the commercial treatment of castor oil to make any remarks on the change of figure likely to arise therefrom, but I give these details respecting a dozen specimens from different parts of the world to show how constant is their behaviour in the production of a characteristic cohesion-figure.

Fig. 8 is a portion of the Balsam of Copaiba figure. I had only three specimens of this balsam to operate on. The first, which is two or three years old, from a wholesale house in the City, gives a splendid figure, consisting of large iridescent disks apparently growing out from under each other and quickly subsiding into a colourless disk with a sharp well-defined edge, just within which appears a string of very minute bosses, which it requires a sharp eye to detect. In the course of ten or fifteen minutes the film does not open into holes, as many films do, but becomes dotted over with pit-like depressions, which enlarge, and gradually the base of each pit opens into a minute network. These particulars I did not stop to describe at the meeting, but they are given in my original description of the figure.

A second specimen, of a brownish colour, gave a very good figure, though not quite so large as that of the first, but it behaved in all respects like it. A third specimen, much more fluid than the above,* shot out rapidly with much less development of colour, and often without any colour at all. The film

* The specimens Nos. 2 and 3 were in long narrow bottles, nearly full. A rough measure may be given of their comparative viscidity when it is stated that on inverting No. 2, the bubble of air under the cork reached the other end while 8 was counted; in No. 3 it travelled through the liquid while counting 2.

was large, the bosses at the edge larger and flatter than in the two former specimens, and not so well defined. A fourth was a specimen of the essential oil of copaiba. It opened with a sudden flash of coloured rings, forming a colourless disk over the whole surface with no bosses at the edge.

On thinning down the second specimen with oil of turpentine a colourless film was produced similar to that of the third.

The second specimen was also mixed with $\frac{1}{3}$, $\frac{1}{2}$, and nearly $\frac{2}{3}$ castor oil, (No 1 castor oil in my twelve specimens being used), and in all cases a film entirely devoid of colour was produced. The splendid iridescent disks of the balsam, and the rainbow-rings of the castor were entirely absent in the mixture of the two, in consequence of the increased thickness of the resulting film. The mixtures were made in a test-tube held in warm water, and stirred with a glass rod.

Fig. 2 is a portion of the figure of a sample of croton oil, of a brownish-amber colour: this opened into splendid rings, which quickly disappeared, when the film retreated upon itself, leaving a minute spray of oil. Another specimen which I have had by me about two years, opened with a fine display of rings, and a corona which formed a large perforated pattern, when the film gathered itself up, and left a trail of oil behind. The figure was like that of the first, only in the gathering up, the edge of the film was torn away. A specimen from the Dutch Court of the International Exhibition, probably from Java, flashed out into a small figure with iridescent rings, and immediately retreated upon itself. A fourth, from the India Museum, of a light amber colour, required to be warmed. It formed a remarkable and beautiful figure, but the display of the usual phenomena was arrested by chilling, a dull frosty silvery appearance coming over the figure, which though very beautiful, prevented the film from telling its history. This oil set and became opaque a little below 50° F. A fifth specimen purchased by me seven or eight years ago in Prussia, gave a very good figure.

Figs. 3 and 4 are portions of the figures of olive oil. Fig. 3 is from a specimen marked "extra sublime," Fig. 4 from a specimen marked "Tuscany, fine." The enormous demand for olive oil offers a great temptation to the use of cheaper oils. In this country the oil of sessame seed is used either instead of olive oil or for mixing with it, while in France poppy-seed oil is largely employed for the purpose. Figures of these are given, Fig. 5 being that of sessame, and Fig. 6 that of poppy.* These oils, together with lard oil, Fig. 7, are also used for mixing with some of the medicinal oils.

A good deal of interest is just now felt respecting linseed oil. I have lately performed a number of experiments with it, an account of which I must reserve until the Journal can better afford space for such minute details.

I may, however, remark in conclusion that the greatest precaution must be taken in ensuring the purity of the glasses used in obtaining cohesion-figures. I have repeatedly found that after glasses have been used with fatty oils they produce nothing but failures, until they have been well washed with caustic potash or sulphuric acid. There may be cases where spirits of wine will be found more convenient than potash, especially in the case of some of the essential oils which do not readily saponify.

P.S.—Since writing the above, I have made some inquiries respecting the commercial treatment of one or two of the oils operated on, and I have also visited the laboratory of a wholesale druggist, where castor oil, as imported, is purified by filtration through bags at a steam heat.

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* The experiments which furnished these figures were performed in winter in a warm room and the oils had to be warmed before they could be used.

What is called "English croton oil" is pressed in this country from imported seeds. Very little oil is so made at present, on account of the trouble in preparing it. There is much difference in the appearance and character of samples, even from the same case or package. One will remain fluid at a low temperature, and another will set speedily into a pasty mass. This may be partly due to the mode of pressing, whether cold or hot, as some oils pressed hot from the seeds or nuts will be harder than oil pressed cold from similar seeds. This has been proved by careful experiments on cocoa-nut oil. It is believed also that some croton is made by pressure and other samples by boiling the seeds which have been first stripped of their outer skin or husk. This may affect considerably both the melting-point of the oil, and also its chemical character, since resinous substances may be brought out in one case and not in another. Similar differences as to melting-points are found in castor oils, and it is not always easy to equalize them even by filtration at the same temperature, as some oils will carry with them more stearine than others. This, my informant knows to be the case, from his own experience in oils. If two oils were cooled and filtered alike, one of which is quite neutral, and the other partly acidified, the latter would be more fluid after filtration than the other. The neutral stearines do not crystallize freely like the acid hard fats. They usually form masses of fine hair-like crystals, which do not separate readily from the oily part, so that a certain proportion will pass through with the oil. The acid fats crystallize out in the form of hard plates or concretions, which bear handling without breaking down, and can be completely separated by filtration.

Again, if two oils pressed from the seeds were packed, one quite clean, and the other more or less contaminated with gum or mucilage, the latter would become more or less acidified, the gum, etc., apparently fermenting, and then setting up an acidifying action in the oil. This may explain some of the differences in the working and character of oils.

Such being the accidents to which commercial oils are liable, I cannot wonder at variations in their cohesion figures, but I do very much wonder that twelve different samples of castor oil should have given figures so much alike as in every case to enable a practised operator to identify the oil, and also, in the case of four specimens of croton oil, one of them solid at ordinary temperatures, all the figures should have a resemblance sufficient for their identification.

THE TINCTURES AND WINES OF THE BRITISH PHARMACOPŒIA COMPARED WITH THOSE OF THE LONDON, EDINBURGH, AND DUBLIN PHARMACOPŒIAS.

BY DR. C. ULRICH.

When the 'British Pharmacopœia' came out, I found it a great help to be able at a glance to compare the strengths of the tinctures and wines of the old Pharmacopœias with the new. To facilitate that purpose I have compiled the following tables, in which the solid ingredients used for preparing the tinctures and wines are brought out in grains, the dissolving medium being always one pint. The tables will be easily understood without any further explanation. As regards the opium preparations, it should be borne in mind that opium loses on an average 15 per cent. of water in drying, and that therefore 85 parts of the powder are equal to 100 parts of crude opium.

Names of Tinctures.	Ingredients.	British Pharmacopœia.	London Pharmacopœia.	Edinb. Pharmacopœia.	Dublin Pharmacopœia.
		grs.	grs.	grs.	grs.
Tinct. Aconiti	Aconite Root	1093·7	3600		4375
	Rectified Spirit	1 pint	1 pint		1 pint
Tinct. Aloes	Socotrine Aloes	218·7	240	266·6	
	Extr. of Liquorice . . .	656·2	720	800	
	Proof Spirit*	1	1	1	
Tinct. Arnicæ	Arnica Root	437·5			
	Rectif. Spirit	1			
Tinct. Assafœtidæ . . .	Assafœtida	1093·7	1200	960	1093·7
	Rectif. Spirit	1	1	1	1
Tinct. Aurantii	Bitter Orange Peel . . .	875	840	840	875
	Proof Spirit	1	1	1	1
Tinct. Belladonnæ . . .	Belladonna Leaves . . .	437·5	960		1093·7
	Proof Spirit	1	1		1
Tinct. Benzoin. Co. . . .	Benzoin	875	840	914·3	
	Prepared Storax	656·2	600		
	Balsam of Tolu	218·7	300		
	Socotrine Aloes	160	150	152·4	
	Peru Balsam			609·5	
	Rectif. Spirit	1	1	1	
Tinct. Bucco	Buchu	1093·7		1200	1093·7
	Proof Spirit	1 pint		1 pint	1 pint
Tinct. Calumbæ	Calumbo	1093·7	720	720	1093·7
	Proof Spirit	1	1	1	1
Tinct. Camph. c. Opio. .	Opium	47	42·3	40	48·2
[Tinct. Camphor. Co. P.L.	Benzoic Acid	40	36	36	41
„ Opii Camph. P.E. .	Camphor	30	25	25	27·3
„ „ „ P.D.].	Oil of Anise	½ fl. dr.	½ fl. dr.	fl. dr.	½ fl. dr.
	Proof Spirit	1	1	1	1
Tinct. Cannab. Ind. . . .	Extr. of Indian Hemp .	437·5			437·5
	Rectif. Spirit	1			1
Tinct. Cantharidis . . .	Cantharides	109·4	120	80	109·4
	Proof Spirit	1	1	1	1
Tinct. Capsici	Capsicum	328·1	300	300	656·2
	Rectif. Spirit	1	1	1	1
Tinct. Cardam. Co. . . .	Cardamoms	109·4	75	75	72·9
	Caraway	109·4	75	75	72·9
	Raisins	875	1200	150	
	Cinnamon	218·7	150	150	145·8
	Cochineal	60	75	30	36·4
	Proof Spirit	1	1	1	1
Tinct. Cascarillæ	Cascarilla	1093·7	1200	1200	1093·7
	Proof Spirit	1	1	1	1
Tinct. Castorei	Castor	437·5	600	840	
	Rectif. Spirit	1	1	1	
Tinct. Catechu	Catechu	1093·7	840	800	875
[Tinct. Catechu Co. P.L.] .	Cinnamon	437·5	600	533·3	437·5
	Proof Spirit	1	1	1	1
Tinct. Chiratæ	Chiretta	1093·7			1093·7
	Proof Spirit	1			1

* The London and Edinburgh Pharmacopœias ordered a mixture of one part of rectified spirit with three parts of water.

Names of Tinctures.	Ingredients.	British Pharmacopœia.	London Pharmacopœia.	Edinb. Pharmacopœia.	Dublin Pharmacopœia.
		grs.	grs.	grs.	grs.
Tinct. Cinchon. Co.	Pale Cinchona Bark	875	960	834·8	875
	Bitter Orange Peel	437·5	720	626·1	437·5
	Serpentary	218·7	180	156·5	164
	Saffron	60	60	52·2	54·6
	Cochineal	30	30	34·8	27·3
	Proof Spirit	1	1	1	1
Tinct. Cinchonæ Flav.	Yellow Cinchona Bark	1750	1920	1920	1750
[Tinct. Cinchonæ P.L.	Proof Spirit	1	1	1	1
„ „ P.E.					
„ „ P.D.]					
Tinct. Cinnamomi	Cinnamon	1093·7	840	810	
	Proof Spirit	1	1	1	
Tinct. Cocci	Cochineal	1093·7			875
	Proof Spirit	1 pint			
Tinct. Colchici Sem.	Colchicum Seed	1093·7	1200	1200	1093·7
	Proof Spirit	1	1	1	1
Tinct. Conii Fructus	Hemlock Fruit	1093·7			
		1			
Tinct. Croci	Saffron	437·5		533·3	875
	Proof Spirit	1		1	1
Tinct. Digitalis	Digitalis	1093·7	960	960	1093·7
	Proof Spirit	1	1	1	1
Tinct. Ergotæ	Ergot	2187·5			1750
	Proof Spirit	1			1
Tinct. Ferri Perchlor.	Iron contained in one pint of the tincture.	437·5	504	504	1400
[Tct. Ferri Sesquichlor. P.L.					
„ „ Muriat. P.E.					
„ „ „ P.D.]					
Tinct. Gallæ	Galls	1093·7	1200	960	1093·7
	Proof Spirit	1	1	1	1
Tinct. Gentian. Co.	Gentian	656·2	600	533·3	656·2
	Bitter Orange Peel	328·1	300	266·6	328·1
	Cardamoms	109·4	150		109·4
	Canella			133·2	
	Cochineal			16·6	
	Proof Spirit	1 pint	1 pint	1 pint	1 pint
Tinct. Guaiaci Ammon.	Guaiac Resin	1750	1680	1600	
	Arom. Spir. of Ammon.	1	1	1	
Tinct. Hyoscyami	Hyoscyamus Leaves	1093·7	1200	960	1093·7
	Proof Spirit	1	1	1	1
Tinct. Iodi	Iodine	218·7	240	600	218·7
[Tinct. Iodinii Co. P.L.	Iodide of Potass.	109·4	480		437·5
„ „ „ P.D.]	Rectif. Spirit	1	1	1	1
Tinct. Jalapæ	Jalap	1093·7	1200	1600	1458·3
	Proof Spirit	1	1	1	1
Tinct. Kino	Kino	875	840	140	
	Rectif. Spirit	1	1	1	
Tinct. Krameriæ	Rhatany	1093·7			1750
	Proof Spirit	1			
Tinct. Lavend. Co.	English Oil of Lavender	¾ fl. dr.	¾ fl. dr.		1½ fl. dr.
	„ „ of Rosemary	5 ♏	5 ♏		½ fl. dr.
	Cinnamon	75 grs.	75 grs.		218·7
	Nutmeg	75	75		109·4

Names of Tinctures.	Ingredients.	British Pharmacopœia.	London Pharmacopœia.	Edinb. Pharmacopœia.	Dublin Pharmacopœia.
		grs.	grs.	grs.	grs.
	Red Sandal Wood . .	150	150		
	Cochineal				54·7
	Cloves				54·7
	Rectif. Spirit	1	1	1	1
Tinct. Limonis	Fresh Lemon Peel . .	1093·7	840		2187·7
	Proof Spirit	1	1	1	1
Tinct. Lobeliæ	Lobelia	1093·7	840		2187·5
	Proof Spirit	1	1	1	1
Tinct. Lobel. Æther. . .	Lobelia	1093·7	1200	1280	
	Spirit of Ether . . .	1	1	1	1
Tinct. Lupuli	Hop	1093·7	1440	1200	1093.7
	Proof Spirit	1	1	1	1
Tinct. Myrrhæ	Myrrh	1093·7	720	872·7	875
	Rectif. Spirit	1	1	1	1
Tinct. Nuc. Vomic. . . .	Nux Vomica	875			
	Rectif. Spirit	1			
Tinct. Opii	Opium	772	847	720	772
	Spirit†	1	1	1	1
Tinct. Quinæ Co.	Sulphate of Quinine . .	160	160		
	Tinct. Orange Peel . .	1 pint	1 pint		
Tinct. Rhei	Rhubarb	875	60	800	656·2
[Tinct. Rhei Co. P.L. . .	Cardamoms	109·4		133·3	218·7
,, ,, ,, P.D.] . .	Coriander	109·4			
	Saffron	109·4	90		54·6
	Liquorice Root . . .		180		109·4
	Ginger		90		
	Proof Spirit	1	1	1	1
Tinct. Sabinæ	Savin	1093·7			
	Proof Spirit	1			
Tinct. Scillæ	Squill	1093·7	1200	1200	1093·7
	Proof Spirit	1	1	1	1
Tinct. Senegæ	Senega	1093·7			
	Proof Spirit	1			
Tinct. Sennæ	Senna	1093·7	840	893·8	875
[Tinct. Sennæ Co. P.L. .	Raisins	875	1200	893·8	
,, ,, ,, P.E. .	Caraway	218·7	105	148·9	109·4
,, ,, ,, P.D.] .	Coriander	218·7		198·6	
	Sugar			595·8	
	Jalap			418·9	
	Cardamoms		30	148·9	109·4
	Proof Spirit	1	1	1	1
Tinct. Serpentariæ . . .	Serpentary	1093·7	840	872·5	
	Cochineal			54·5	
	Proof Spirit	1 pint	1 pint	1 pint	
Tinct. Stramonii	Stramonium Seeds . .	1093·7			1093·7
	Proof Spirit	1			1
Tinct. Tolutanæ	Balsam of Tolu . . .	1093·7	480	900	875
	Rectified Spirit . . .	1	1	1	1
Tinct. Valerianæ	Valerian	1093·7	1200	1200	1093·7
	Proof Spirit	1	1	1	1
Tinct. Valer. Ammon. . .	Valerian	1093·7	1200	1200	
	Arom. Spir. of Ammon.	1	1	1	
Tinct. Zingiberis	Ginger	1093·7	600	600	1075
	Rectified Spirit . . .	1	1	1	1

* The British, London, and Dublin Pharmacopœias order proof spirit; the Edinburgh Pharmacopœia orders a mixture of two parts rectified spirit with one part of water.

Names of Wines.	Ingredients.	British Pharmacopœia.	London Pharmacopœia.	Edinb. Pharmacopœia.	Dublin Pharmacopœia.
		grs.	grs.	grs.	grs.
Vin. Aloes	Socotrine Aloes . . .	328·1	480	360	
	Cardamoms	40		46·6	
	Ginger	40		46·6	
	Canella		120		
	Sherry	1 pint	1 pint	1 pint	
Vin. Antimoniale. . . .	Tartarated Antimony. .	40	40	40	40·4
[Vin. Antim. Potass. Tart. P.L.					
Liq. Antimon. Tart. P.D.] .	Sherry*	1	1	1	1
Vin. Colchici	Colchicum Corm. . . .				
	Sherry				
Vin. Ferri	{ Iron contained in one pint of the wine. }	33·4	12		
Vin. Ipecacuanhæ . . .	Ipecacuanha	437·5	600	600	546·9
	Sherry				
Vin. Opii	Opium†	772	1200	548·5	772
	Cinnamon		75	68·5	
	Cloves		75	68·5	
	Sherry	1	1	1	1

In conclusion, I give a list of the tinctures and wines of the three old Pharmacopœias that are left out in the British Pharmacopœia.

London Pharmacopœia.	Edinburgh Pharmacopœia.	Dublin Pharmacopœia.
Tinct. Aloes Comp.	Tinct. Aloes et Myrrh.	Tinct. Camphor.
,, Ammoniæ	,, Camphoræ	,, Cinnamomi Comp.
,, Cinnamomi Comp.	,, Cardamomi	,, Cubebæ
,, Colchici ,,	,, Cassiæ	,, Ferri Acet.
,, Conii ,,	,, Castorei Amm.	,, Guaiaci
,, Cubebæ ,,	,, Cinnamomi Comp.	,, Matico
,, Ergotæ Æther	,, Conii	
,, Hellebori	,, Cuspariæ	
	,, Lactucarii	
	,, Opii Ammon.	
	,, Quassiæ	
	,, ,, Comp.	
	,, Rhei et Aloes	
	,, ,, ,, Gentian.	
	,, Veratri	
Vin. Veratri	Vin. Gentianæ	Vin. Rhei
	,, Rhei	
	,, Tabaci.	

40, London Street, Fitzroy Square.

THE STATE OF PHARMACY IN RUSSIA AS COMPARED WITH THAT IN ENGLAND.

The condition of the pharmaceutical profession is of the greatest public importance. After the medical profession, the pharmaceutical commands the

* The Dublin Pharmacopœia ordered a mixture of 1 part rectified spirit with 3 parts water.
† The London Pharmacopœia ordered 600 grs. Extr. Opii, equal to 1200 grs. Opium.

greatest consideration, not of Government alone, but also of the public at large. The science of "pharmacy" is so closely linked up with the science of medicine, that it may well be said one cannot effectually exist without the other; but at the same time, it must be understood that these professions, however intimately related, must be kept distinctly separate. The branches of science which must necessarily be known by the followers of these professions have reached such a wide-spread development, that should they continue to progress at the same rate, it will soon be impossible for *one* individual to obtain a thorough knowledge of all of them. The fact of medical men possessing a full knowledge of their profession, but devoting themselves to the study and practice of special diseases only, shows the correctness of the above assertion. This admitted, and it becomes evident that either of these professions has in itself sufficient upon which a man's whole energies should be devoted; and considering also the progress of science, and the necessity for public safety, it cannot be surprising that the feeling is daily increasing that pharmacy should be raised to a level with other professions, and *cease* to be a trade.

On the Continent, the title of "Apothecary," and the right of selling medicine, is limited to those only who have obtained the degree of "Apothecary;" and even these are bound by oath to adhere, under the penalty of being deprived of their diploma, to certain laws, the object of which is the safety of the public.

In Russia, where they have copied from Germany almost all the laws and regulations relating to learned institutions, the following system works with the greatest and most efficient success. Every one who wishes to become an "Apothecary" has to show his certificate of having passed with efficiency through the first four classes of the Government school in a certain allotted time, viz. four years. During this period the candidate will have been examined in the following subjects:—the Latin tongue, the Greek, Russian, German, and French languages; arithmetic, mathematics, history, geography, and natural history.

The candidate is then admitted an apprentice in a "pharmacy" or pharmaceutical establishment, having been duly registered at the "Medical Police." During his apprenticeship he has ample opportunity of learning practically the following subjects:—

Pharmacopy, pharmacognosy, pharmaceutical chemistry, botany, practical dispensing, and the reading of the most abbreviated prescriptions.

At the expiration of three years he passes, at one of the University Colleges, a theoretical and practical examination of the above-named subjects. If found efficient, he attains the degree of "Subject," which entitles him to the situation of assistant. Having registered his new degree with the proper authorities, he has to serve another three years in his new post of assistant, and at the end of that time he has to study two years as pharmaceutical student in a Russian University College, and afterwards pass a very close and minute examination in the following subjects:—

Chemistry, organic and inorganic, analytical and pharmaceutical; botany, mineralogy, zoology, natural history, pharmacology, forensic medicine, and toxicology.

This examination entitles the "Subject" to the degree of "Provisor," or manager of a "Pharmacy." If a provisor writes at his examination a dissertation on some pharmaceutical subject, and is able to defend it before the Board of Examiners, he is entitled to the highest degree—that of "Magister." This degree is optional, and a "Provisor" is considered by law a pharmaceute, entitled to manage or possess a "pharmacy." In every town in Russia there is a *limited* number of "pharmacies," and a "Provisor" must take his chance in buying the privilege, or undertaking the management of one of these places. In Odessa, for instance, a town of about 100,000 inhabitants, the number of "pharmacies" is limited to eleven, which cannot be exceeded without the sanc-

tion of the medical authorities in St. Petersburg. The responsibility of a manager rests in the observance of the following duties:—

1. Keeping a stock of all drugs fixed by the Medical Board in St. Petersburg.
2. Dispensing nothing but by the prescription of a medical man.
3. Keeping books (as prescription-book, cash-book, etc.) confirmed and registered by the Medical Police.
4. Filing and keeping the original prescriptions for a period of not less than three years.
5. Charging for medicine according to the Medical Tax-book.
6. Keeping only Patent Medicines which have been analysed and approved by the Medical Board of St. Petersburg.

Every "Pharmacy" receives once a year an unexpected visit of the members of the Committee of the Medical Police.

The Pharmaceute, as well as the medical man, is exempt from all civil duties, taxations, and enjoys many privileges.

This system works very well, and though it is perhaps impossible to introduce it into this country, *something* might be done approaching it.

After a careful reading of the pamphlet, 'The Pharmaceutical Society of Great Britain,' published by the Society in 1863, I come to the conviction that, with a few alterations in the system carried on by the Society, and with an additional Pharmacy Act, *authorizing the sale of drugs, or the dispensing of prescriptions by those only who have passed with efficiency the "Major Examination,"* incalculable benefit would be afforded to the public. There would be a better knowledge of the profession, and the public would have greater means of safety in a most important matter of every-day life.

Should such improvements be introduced, there is little doubt the majority of the medical profession would willingly give up the practice of selling drugs, or preparing prescriptions for their patients. And should this unjust practice not be discontinued, it might be enforced by Act of Parliament.

At all events, the time has come when the medical and pharmaceutical professions, as well as the public, see the necessity that SOMETHING MUST BE DONE; and if it must be done, the sooner the better. CH. W.

Manchester.

NOTE ON THE MEDICINAL PROPERTIES OF *ACHILLEA MILLEFOLIUM*, LINN.—YARROW, MILFOIL.

BY E. J. WARING, ESQ., F.L.S.,

Her Majesty's Indian Medical Service.

This plant, which is common in most parts of Europe, is supposed to be one of the kinds of *millefolium*, or *myriophyllon*, of Pliny.* It has also become thoroughly naturalized in the northern and middle States of North America, where, according to Griffith,† it is endowed with more active qualities than the European-grown plant. All parts of the herb possess an agreeable smell, and a bitter aromatic and slightly astringent taste; the aromatic qualities being most marked in the flowers, and the astringent and bitter qualities in the leaves and root. The leaves analysed by Sprengel‡ were found to contain water, 85; substances soluble in water, 5·9; substances soluble in caustic potash, 2·7; wax, resin, and chlorophyll, 0·28; and lignin, 5·9 = 100. According to the researches of Zanon,§ the herb contains a bitter principle, *Achilleine*, and a peculiar acid, which he has denominated *Achilleic Acid*. By distillation it yields an essential oil (*Oleum millefolii ethereum*, or *Ætheroleum millefolii*).

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* Hist. Nat. lib. xxiv. cap. 95.

† Medical Botany, p. 403.

‡ Arch. et Viol. Dict. des Chim. Anal. i. p. 9.

§ Liebig, Annalen, lib. viii. p. 21, 1847.

By the older pharmacologists it was regarded as an excellent vulnerary and styptic, a character in which it is still esteemed by the lower classes in Europe; hence its popular French name *Herbe aux Charpentiers.* It has also been regarded as efficacious in internal hæmorrhages, leucorrhœa, nervous debility, epilepsy, colic, and in all cases requiring tonics, stimulants, and anti-spasmodics. In Sweden, according to Linnæus,* it is employed for increasing the intoxicating powers of beer. The root has been used as a substitute for serpentaria, but Griffith states that the trials made with it have proved that it is very inefficient. As a remedial agent, it may be given in the form of extract, in doses of grs. v.–xxx; or tincture (one part of the herb to six parts of alcohol), in doses of ʒss—ʒi. The dose of the expressed juice is ℥iss—℥iii, and that of the essential oil, gutt. x–xxx. Though rarely employed in modern European practice, it seems to merit further attention in the following cases:—

1. *In suppression of the lochia* it was formerly employed with alleged success by Maumery,† and this practice has recently been revived by Dr. Rouzier-Joly,‡ who relates two cases illustrative of the emmenagogue powers of this plant; but further observations are necessary to establish its character as an emmenagogue. It is worthy of remark that in former times it was praised for a diametrically opposite state; thus Dodoens,§ writing in 1586, remarks,—"A decoction of Milfoyle drunken stoppeth all fluxes, especially the red flux in women that floweth too abundantly."

2. *In hæmorrhoidal affections* it has long enjoyed considerable repute, both as a local application and as an internal remedy. The recent trials with it by Dr. Teissier,‖ given internally in the form of infusion or expressed juice, seem to establish its utility beyond a doubt. He found it effectual not only in diminishing the size of hæmorrhoidal tumours, but in arresting hæmorrhoidal discharges, whether sanguineous, purulent, or mucous. This, he considers, is effected, not simply by the astringent property of the remedy, but by a special action on the vessels and nerves of the rectum. He limits its use to passive atonic states.

3. *In some atonic affections of the bladder attended with discharges* it is well thought of by some American practitioners. "It is asserted," remarks Dr. Porcher,¶ "that this plant has a marked tonic power upon the bladder; it is employed in debility of that organ, and is especially useful in correcting the involuntary discharge of urine in children." May it not be that the special action which Dr. Teissier found this plant to exercise on the vessels and nerves of the rectum, may extend beyond that viscus to the neighbouring viscus—the bladder?

4. *In intermittent fevers* it has the recommendation of Ferrein; but probably its use in this class of cases would have been buried in oblivion, had it not been for the statement of M. Zanon,** that the bitter principle of the plant Achilleine used in Southern Europe as a substitute for quinine. If this be correct, the parent plant may merit attention as an antiperiodic.††

THE REQUISITION TO THE COUNCIL.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—In the last number of the Journal was a report of the proceedings of the Liverpool Chemists' Association. It contains the following statement:—

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* Flor. Suec. p. 269. † Journ. de Méd. xxxiv. p. 402.

‡ Bull. Gén. de Thérap., June 30th, 1857.

§ Herbal, ed. 1586, p. 161. ‖ Gaz. Méd. de Lyon, Jan. 31st and Feb. 15th, 1857.

¶ Med. Bot. of South Carolina, p. 796 ** Op. cit.

†† [*Achillea Millefolium* has been introduced into the Secondary List of the Materia Medica in the recently-issued United States Pharmacopœia.—Ed. Pharm. Journ.]

Dr. Edwards said that he had received a printed copy of a requisition *from the United Society of Chemists and Druggists*, urging the necessity of incorporating that body with the Pharmaceutical Society.

To my very great astonishment, in the 'Chemist and Druggist' of the 15th inst., I find a letter from Dr. Edwards, to the effect, that he was not faithfully reported in the Journal, and that the requisition he referred to at the Liverpool Association meeting was the selfsame requisition which was advertised by the Council last month, which we debated on the 17th inst., and which I had, as Honorary Secretary to the requisitionists (Pharmaceutical Chemists), forwarded to the Council.

Your readers, on comparing the requisition advertised in your last number with the report given at the same time of the meeting of the Liverpool Association, will see that there the former does not bear the construction placed upon it by the Liverpool reporter.

I have only to add, that the requisition originated neither with the Council of the Pharmaceutical Society nor with the United Society, but is entirely an independent expression of opinion on the part of the requisitionists.

I am, Sir, yours obediently,

30, *Bucklersbury, March* 21*st*, 1864. B. B. Orridge.

PROPOSED LEGISLATION AFFECTING PHARMACY.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—Will you excuse my calling your attention to a statement in that first-class Journal the 'Medical Times and Gazette,' February 13, 1864, in my opinion as erroneous as it is unjust to the intelligence of the main body of the trade. "It is a matter of daily observation that any intelligent, neat-handed lad, or woman of ordinary education, can be taught to dispense *accurately* and *well* in three months." Now I am not a member of the Pharmaceutical Society, but am an advocate for the examination of all those who have the responsibility of dispensing medicines, and don't like to see our body treated thus without a remark in reply; neither do I see the very great harm the writer seems to dread being done if our business was raised from a *trade* to a profession, even though the line of demarcation between the pharmaceutical chemist and the practitioner in medicine who keeps an open surgery and shop were rendered more inappreciable in the eyes of the public. The fact asserted in the preface of the new Pharmacopœia, that the manufacture of most chemicals has of late years been transferred from the pharmaceutical chemist to the chemical manufacturer, does not render it any the less incumbent upon dispensers to know their composition, and the very fact of their manufacture having been so transferred should only be looked upon as another cause or reason for examination; for if each chemist had to make his own chemicals it would be certain he knew their composition, but as he has not to do so, the fact should be ascertained by compulsory examination before he is allowed to dispense such substances. Trusting this may call your attention to the article referred to, if you have not already noticed it,

I am, etc., yours truly,

John Ruddock.

Sir,—Doubtless you will have noticed the castigation your respected Journal has received from the pen of your contemporary 'Medical Times' last week. But, notwithstanding the severity of his sarcasm, we ought to thank him for

so pleasantly carrying us back to our schoolboy days, by reminding us of those compositions we then used to write, in which we were wont to advance arguments containing their own refutation, and to ask questions without thinking what answer might be given to them. When we go for a recreative ramble through the pages of a fictitious novel, or other *work entertaining in its day and generation*, we go prepared to overlook all the discrepancies or contradictions of circumstance or opinion the author thinks proper to put therein; but when we take a first-class journal, supposed (as you observe) *to express the opinions of those for whom and by whom it is written*, and intended to be useful not only in its day and generation, but to have an effect in the time to come, we naturally expect to find consistency of thought and expression. Let us look at this wonderful article, and see whether it is consistent or not. "In professions, knowledge alone is sold; in trades, material." "A chemist's business is simply a matter of buying drugs, compounding and selling them;" and yet "we see districts where the medical man"—the professional man—"is paid by his physic, and where the only remuneration paid for his *professional* services is the profit contingent on the medicines supplied;" and if the chemist and druggist were to pass an examination, it makes his business a profession at once, notwithstanding it remains the same matter of buying drugs, compounding and selling them, that it was before. Then he says, "The physicians would wish their prescriptions dispensed as they wrote them." We see there are mistakes among medical men; but would your contemporary say those mistakes would not be much more frequent were every man allowed to practise and prescribe without first giving proof of his ability? and yet he asks, "Would a certificate of competency be any safeguard that no *mistakes should ever be made* in the shop of the possessor?" We don't say it would; but is it not reasonable to suppose that it would diminish their number, even as the certificate of competency to practise the art and mystery of medicine does so in the case of the profession? "If a man is killed by the prescription of a physician, the penalty of the law would not fall on the dispenser, if his duty be accurately performed, but on the prescriber." What is the *duty* of the dispenser,—to correct errors where they may by accident occur, or to shut his eyes to them? I very much doubt whether any court of law would exonerate that man who dispensed a prescription and put the direction on it, knowing at the same time, if those directions were followed (which most likely would be the case), that death must ensue; but, supposing the law did exonerate him, what would that other class of judges (the public) say to it? Undoubtedly that man's business would be sacrificed, and (to quote his own words again) "that the public do form an adequate judgment, the position of such houses as Allen's, Savory's, Bell's, Morson's, Bullock's, Squire's, Corbyn's, and a dozen others we could mention, prove." "What law is to prevent a chemist visiting when sent for?" I presume the same law that has hitherto done so since the passing of the Apothecaries' Act. Which class are most likely to send those who apply to them for physic to a qualified practitioner, the educated pharmaceutist or the "drysalter and oilman"? The position of the houses just referred to sufficiently indicates the quarter from whence the justly judging public apprehend the most danger. Such is my view of the case; and I must say that even though writing in the interests of the "great medical profession," as the writer of that article admits he does, I see no reason why justice should be lost sight of, and one class lowered for the exaltation (?) of the other. Apologizing for trespassing so long on your valuable time, I hope you will continue to maintain our cause as faithfully and as well as hitherto; *et in hac spe, maneo.*

Yours respectfully,

March 8th, 1864. ONE OF THE TRADE.

DUTIES OF MASTERS AND APPRENTICES.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—On reading the recent correspondence in the pages of the Journal on the duties of masters and apprentices, I feel considerable astonishment at the sublime ideas that are entertained by some respecting business and its requirements, and I feel at a loss to conjecture to what state of blissful perfection the trade is destined. Is it desired that we shall all become encyclopædists, and discard the sober realities of business for the ethereal pleasures of science?

Some of your correspondents appear to follow business as a recreation, and to entertain the notion that those who have apprentices ought to spend their time during the day, or evening, in lecturing them on chemistry and botany, etc., the more substantial part of practical business being neglected, or made of minor importance. What is the practice in the other professions? Does the medical man teach his pupil anatomy and physiology; or the lawyer the abstract principles of jurisprudence? I trow not. All that is undertaken, and all that can be properly done, is to teach the business as it is practically conducted in the establishment, accompanied, as time and circumstances permit, with such observations as suggest themselves.

In establishments where business worthy of the name is conducted, there is, or ought to be, little time for abstract pursuits. All the faculties most of us possess are required to conduct our very complicated and onerous duties. Of what value would the highest attainments in science avail, if the youthful possessor were unable to dispense a prescription, or make up a receipt for a horse-ball *secundum artem?* His only resource would be a lectureship. If his ambition centred in this, it was his duty to have entered a school of science, not the shop of a pharmaceutist. My object is not to discourage the pursuit of science, but to correct the morbid sympathy which is frequently finding expression in the letters of your correspondents.—I am, Sir, yours most obediently,

COMMON SENSE.

Bradford, February 16, 1864.

BOTTLES FOR POISONS OR DANGEROUS MEDICINES.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—I have read with some interest occasional discussions of the Pharmaceutical Society relative to a preventive bottle for poisonous preparations, and have felt some surprise at the variety of opinion and unsatisfactory conclusions, when the question might have been so easily set at rest by adopting a shape never used in dispensing. The bottle best suited for this purpose appears to be the one selected many years ago by the old firm of Allen, Hanbury, and Barry, viz. the old conical octagon. It is a shape never used for dispensing medicines, and therefore most likely to attract attention, which is the great point to be secured. Some years ago the York Glass Company introduced this bottle in blue flint, and it is now extensively used for poisonous preparations. About the same time the Company also introduced the same-shaped bottle with a patented grooved stopper, admirably adapted for administering strong and dangerous medicines in drops; but either from inattention or an objection to spare time to explain the manner of using it, it has not secured that attention which, as a really ingenious invention, it is entitled to. Now, however, that dispensing chemists are again agitating this question, its adaptation may be carefully examined and appreciated; at any rate, a peculiar and unusual shape should be selected, because of the security it would

give to families amongst whom by far the majority of fatal mistakes occur. Whatever form may be decided upon, it must be evident to every one interested that curiously-devised labels would not do; neither will a round, square, flat, oval, or octagon bottle covered with such a label, because all these shapes are used for dispensing, and (I am sure that I am not stating too much) *to the persistent use of these shapes for strong and poisonous preparations may be traced nearly all the fatal mistakes that take place.* To shorten my communication, I will give a case which some time ago came under my observation, and which bears so strongly upon this question, that I think the most dubious will admit that immunity must be sought for in peculiarity and uncommonness of shape. A gentleman in the north of England was under treatment by a medical friend of mine, who sent out his medicine in six-ounce oval bottles, labelled with the ordinary narrow slip used by surgeons. In the same room the patient had a six-ounce oval bottle of liquid blister, *covered entirely* on one side with a printed label. Notwithstanding this difference, he went into his room for a dose of medicine, took up the blister bottle, poured out a dose, and took it. My medical friend was immediately called in, who administered antidotes, and the patient ultimately recovered, though slowly. When asked how he could have made such an egregious mistake, he replied (and now mark), "Oh! the bottle happened to be the same shape as the one containing my medicine, which so misled me that I never once thought about the label." I could give similar cases, but I think this one may suffice to show that immunity must be sought for in peculiarity of shape. In this case, had the liquid blister been in a six-ounce conical octagon, the shape would have arrested attention, the gentleman would have read the label, and avoided a very nearly fatal mistake.

I have represented the York Glass Company upwards of twenty-three years, and during this time have had numerous conversations on this subject with all the principal dispensing chemists in Scotland, part of Ireland, and the Northern and Midland Counties of England, and, with few exceptions, all these gentlemen have admitted over and over again, that curiously-devised labels upon the ordinary shaped bottles do not answer, and that safety is only secured by peculiarity in shape. I am not, then, giving my own ideas in particular, but opinions the result of conversations and discussions. My letter, therefore, may be considered entitled to some share of consideration, which, I think, the importance of the question requires. I did intend following up this subject by recommending another shape, the direct square, as standard dispensing bottles for all poisonous liquids and powders; but having already trespassed too far, I shall reserve what I have to state for another occasion.

Yours respectfully,

HENRY FALL.

ON THE REMOVAL OF STAINS FROM SILK.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—I send you the following particulars, thinking they may be interesting, if not useful, to some of your readers who may be yet uninformed on the subject:—

Being anxious to discover some means by which the colour could be restored that had been extracted from a violet silk dress by acid-juice having been accidentally thrown upon it, I applied to more than one chemist and druggist, thinking there must be some chemical agent which would restore violet, as spirit of hartshorn, it is well known, will restore black.

Not being able to obtain any information on the subject, I thought of trying some experiments for myself; the first proving successful may be worth

recording, if only to amuse the more learned with an account of the simple attempts of an amateur.

Having recently superintended the "iodine process" for annihilating a blot of marking-ink from linen, it occurred to me to try it upon the violet silk; the plan I adopted is as follows, and will serve as a recipe:—*Brush the portion of fabric with tincture of iodine, then, after a few seconds, well saturate the spot with a solution of hyposulphite of soda, and dry gradually;* the colour is perfectly restored, and I consider my experiment highly satisfactory.

March, 1864. M. A. B.

P.S.—I should have stated that it was knowing something of the chemical composition and properties of iodine induced me to make the experiment which I have described.

THE NEW ZEALAND INDUSTRIAL EXHIBITION, 1865.

Offices of the Royal Commission, Dunedin, Otago, New Zealand, 17th November, 1863.

Sir,—I have the honour to forward, for the information of the Pharmaceutical Society, copies of documents, by which you will perceive that a Commission has been issued in the name of her Majesty for the holding of an Industrial Exhibition at Dunedin of the products and manufactures of New Zealand, and such products and manufactures of other countries as may in the opinion of the Commissioners be eminently calculated to aid in the development of the colony.

The Commissioners desire to see a complete collection of drugs and chemicals amongst the exhibits, and would be greatly obliged to your Society for any aid they can afford them in the matter, either by themselves exhibiting, or inducing others to do so.

The agent for the New Zealand Government, Mr. John Morrison, Adelaide Place, London Bridge, who has been requested to act as the agent for the Commissioners, would afford any further information relative to the Exhibition.

I have the honour to be, Sir, your most obedient servant,

ALFRED ECCLES, *Honorary Secretary.*

PHARMACY IN JAMAICA.

We extract the following from the 'Jamaica Guardian' of January 7, 1864:—

"Several parties having applied to us to know what are the provisions of the Bill which has been introduced into the House of Assembly by the Government to provide for the registration of chemists and druggists in this island, we take the earliest possible opportunity of giving a synopsis of the measure. The first clause provides that upon the passing of the Act, the Island Secretary shall be the registrar, and the office of enrolment the registry office, of duly-qualified chemists and druggists. The third enacts that every person who, having obtained a certificate of his competency to compound and dispense medicines, actually compounded and dispensed medicines and drugs as a chemist and druggist in this island previous to the passing of the Act, shall, on payment of a fee of ten shillings to the registrar, and production to him of such certificate, and a declaration, or of a declaration where the certificate has been lost or cannot be found, according to a form set forth in the Act, signed and declared to by him, be entitled to be registered as a duly-qualified chemist and druggist. The fourth clause is to the effect that it shall be lawful for any two duly-qualified and registered medical practitioners in this island, on the application of any person who may have served an apprenticeship of three years to a duly-qualified and registered practitioner of medicine and surgery in this island, and who is desirous of being certificated to act as a druggist, to examine such person touching his qualifications to act as such, and, upon being satisfied thereof, to grant to such person, under their hands and seals, a certificate of his qualification to compound and dispense medicines, drugs, and chemicals, which certificate shall bear a stamp of twenty shillings; and such person shall record the certificate in the office of

enrolments in this island, and be entitled upon doing that, and that upon the payment of a fee of ten shillings to the registrar, to be registered as a duly-qualified chemist and druggist. The fifth clause provides that after the passing of the Act no person shall presume to compound and dispense any medicines, drugs, and chemicals as a druggist, or in any manner to act as such within this island, without having first duly recorded in the manner aforesaid the certificate he may be possessed of, and being registered according to the provisions of the Act. The following are the remaining clauses of the Bill, *verbatim*:—

"Sixth.—Any person who shall, after the passing of this Act, pretend to be, or take or use the name of druggist, or any name or description implying that he is a registered druggist under the Act, or shall dispense drugs and charge for the same, even though the money has not been received, shall, upon a summary conviction before any two justices of the peace, pay a fine not exceeding [*ten*] pounds; but nothing in this Act contained shall be construed to extend to prevent any person from vending patent medicines without being registered as a druggist.

"Seventh.—The registrar shall, on the (first) of (July), one thousand eight hundred and sixty (four), and (first) day of (January), one thousand eight hundred and sixty (five), and on every succeeding (first) day of (July) and (January), or within (thirty) days thereafter, cause to be published in the 'Jamaica Gazette,' by authority, a list, signed by him, of the names, in alphabetical order, according to their surnames, of the several chemists and druggists on the register on every such (first) day of (July) and (first) day of (January), under a penalty of (twenty) shillings for every neglect.

"Eighth.—A copy of the 'Jamaica Gazette,' by authority, containing a list of the names of chemists and druggists, published as by this Act is directed, shall be evidence in all courts, and before all justices of the peace and others of the registration, according to the provisions of this Act, of the several persons whose names are mentioned therein.

"Ninth.—Upon the passing of this Act, the Governor shall appoint in every parish of this island one or more qualified practitioners of medicine and surgery, who shall have power and authority, and are hereby required, at reasonable and convenient times, as often as to them shall seem expedient, to enter into any shop, store, or house of any person whatsoever in which medicines, drugs, or remedies for internal or external use are kept or prepared for sale, and to search, survey, prove, and determine if the said medicines, drugs, and remedies shall be of good, sound, and wholesome quality, and cause to be burnt, or otherwise destroyed, all such medicines, drugs, and remedies as they shall find false, adulterated, corrupt, or decayed; and every person who shall obstruct, or cause to be obstructed, any such authorized practitioner of medicine and surgery in the execution of his said duty, shall be subjected to a penalty not exceeding [*ten*] pounds.

"Tenth.—All persons vending poisons, or poisonous drugs, shall keep the same in a separate place, under lock and key, under the penalty of [*thirty*] pounds.

"Eleventh.—Any penalty imposed by this Act may be recovered in a summary manner before two justices of the peace of the parish or precinct wherein the penalty was incurred, and may be proceeded for and recovered or enforced under the provisions of the thirteen Victoria, chapter thirty-five, or any Act now or hereafter to be in force relating to summary proceedings; and, when recovered, one-half thereof shall be carried to the credit of the general revenue of this island, and the other half be given to the informer or prosecutor; and such informer shall, notwithstanding, be a competent witness for the prosecution in the case.

"The measure stands for a second reading in the House, and we hope it will meet with the careful consideration which it deserves from honourable members. There can be no doubt that legislation is required in this direction, as it is notorious that there are many individuals in different parts of the island engaged in the vending of drugs who are utterly unqualified for such an occupation. We venture to say that in no country is such licence permitted in this respect as is allowed in Jamaica. It is high time that some remedy to this state of things should be devised; and we trust that the 'collective wisdom' of the country will be able, without prejudice to existing interests of a legitimate character, to impose some effectual check upon the indiscriminate and careless way in which medicines are now vended throughout the country."

CINCHONA CULTIVATION IN JAMAICA.

With reference to our article published a few days since, on the introduction of Cinchona plants in Jamaica, we had the gratification of announcing that two of the most valuable alkaloids peculiar to their barks, viz. quinine and cinchonine, had been obtained from the young leaves by Staff-Surgeon Dr. Daniell, in sufficient quantities to justify the belief that the permanent establishment of these products in our mountain districts must eventually prove to be an inestimable acquisition to the resources of the island. The species of Cinchona constituting the subjects of these experiments comprised the leaves of the *Cinchona succirubra*, or red bark, *C. micrantha* and *C. nitida*, or grey barks. The specimens were transmitted by Mr. Wilson, for examination and analysis, to Dr. Daniell, from Cold-spring coffee plantation, a locality of about 4000 feet elevation, and therefore, from its position, well adapted for their development and propagation. The prosperous rearing of these plants, it is evident, cannot otherwise than be dependent on the sites selected for their naturalization and subsequent growth, and on these points the indications for our guidance are obviously those where the local climate and natural advantages of soil approach, or may be assimilated as far as practicable, to those forest regions from whence they were originally exported; indeed, the prominent feature tha regulates their commercial or medicinal value is the quantity of alkaloids they are supposed to yield. The production of these organic bases is influenced, to a considerable degree, by the altitude of various mountain slopes or ranges, with their respective climatic agencies. A cool and somewhat equable temperature, a misty or humid atmosphere, the sequence of alternate rains and sunshine, with a moderate heat throughout the day, rendering the leaves constantly bedewed by moisture, in combination with a rich vegetable mould, are conditions deemed most favourable for the increase of their remedial qualities. These objects were doubtless held in view by the island botanist, when, as approximating towards such congenial requisites, he resolved to institute the experimental trial of their acclimation on the Cold-spring estate, the success of which is now placed beyond question by the following interesting statements:—

In November, 1861, a number of young Cinchona shoots, from two to two inches and a half high, were transplanted from the gardens of Bath to the above-mentioned estate. In the course of a year, one of the hardiest (*Cinchona succirubra*) attained nearly four feet (forty-four inches) in height, with leaves from thirteen to fourteen inches in length, and between eight and nine inches in breadth. The dimensions of this plant, at this date (two years of age), have advanced to six feet, bearing ten branches, and a stem, the circumference at the base of which is not less than four or five inches. Other seedlings of the same species, with those belonging to the *Cinchona micrantha* and *C. nitida*, removed at a similar period, have progressively gained corresponding proportions, and several of the latter kind possess not only branches, but leaves measuring fourteen inches long by ten inches broad. By a recent Report, the whole are in a remarkably healthy and flourishing state. Thus, so far, the two great problems, whether the climate and altitude of the mountain regions of Jamaica might be found propitious for the development of these invaluable products; or whether, if, under such circumstances, they would yield a sufficient supply of febrifuge alkaloids to repay the cost and trouble of their cultivation, have been decisively solved.

In connection with the subject, there are, however, other details well worthy of consideration. It is now clearly understood that the constituent alkaloids of the Cinchona trees differ, not only in amount and variety, but also with reference to their medicinal effects on the human system. These therapeutical properties, to a great extent, determine the appreciation of each species. In several respects, therefore, the most important and remunerative of all the Cinchonæ at present under culture in the island is the *C. succirubra*, or red bark. In about equal proportions, it affords a richer percentage of quinine and cinchonine than any other species, not even excepting the famous yellow bark (*Cinchona Calisaya*). The young shoots have hitherto proved to be the most vigorous and hardy, of ready propagation and easy growth, and Mr. Wilson remarks that he has experienced less difficulty in preserving them alive than any of the other kinds. On the Cold-spring district they were planted in open spaces between the coffee bushes, freely exposed to the influences of fresh air, rain, and sunshine, and required no further attention than an occasional clearance of the circumjacent weeds.* Another argument

* The following meteorological data, recorded in 1859 at the Military Hospital, Newcastle,

in their favour is, they thrive at comparatively low elevations (from 2500 to 3000 feet), and consequently sustain a warmer temperature for their development than the ordinary cinchonæ. That they can produce quinine at a still inferior altitude is equally certain, for from a sample of few leaves forwarded from Mount Essex, at Bath, barely over 2000 feet above the level of the sea, and at present constituting the temporary site where the majority of the Cinchona plants are placed, Dr. Daniell discovered they contained a tolerable amount of this and other alkaloids. Notwithstanding various local disadvantages of this position, it must be held in remembrance that during the greater portion of the year unceasing rains prevail, frequently in continuous torrents, when the atmosphere, saturated with humidity, copiously bathes, in the form of mists and dew, the tender leaves, and thus promotes their permanent vigour and maturity.

In the recent experiments, the fact of the leaves having, according to a rough estimate, yielded so much as 0·75 to 1·00 per cent. of alkaloids, leads to the inference that the bark will supply a good average proportion of these febrifugal elements. In their extraction the formula followed was that directed by the Edinburgh College of Physicians in the preparation of quinine from yellow bark, on account of the ease and simplicity of the process. The characteristic white acicular, or needle-like crystals of quinine deposited on the evaporating glass, could be plainly discerned by the naked eye, and presented a striking contrast to the larger, flat, four-faced oblique prisms of cinchonine procured from the residual liquor. From a few young leaves of the *Cinchona micrantha* and *C. nitida*, likewise gathered on the Cold-spring plantation, sulphate of cinchonine, with other amorphous crystalloids, probably cinchonidine or quinidine, were eliminated; but, owing to the limited quantity of material submitted for analysis, no definite proportions could be ascertained. Nevertheless, it is a source of satisfaction to know that their constituent alkaloids have not been dissipated by removal to another country. Weddell had noticed that the *C. micrantha* often preferred the lower declivities of valleys and banks of rivers to other localities, but in regions invariably above 4000 feet elevation, and it is stated that the *C. nitida* chiefly flourishes in still more lofty altitudes. It would therefore be desirable that these species, if possible, should be introduced into

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a station situated on an adjacent mountain spur, and of corresponding height (the mess-house being 4050 feet above the sea), offers a fair criterion of the average local temperature of this zone.

1859. Months.	TEMPERATURE FOR YEAR.				Rainfall in Inches.	WINDS.
	Mean Minimum.	Mean Maximum.	Mean of Month.	Mean monthly dew-point.		
January...	60·1	69·4	63·6	57·8	2·68	N.W. Westerly.
February	59·8	68·3	61·1	57·9	5·32	S.E. N. Westerly.
March ...	59·9	70·2	64·1	58·1	0·60	N.W. and S. Easterly.
April	61·1	72·1	65·9	58·5	6·75	S.E. and N. Westerly.
May	62·2	72·4	66·0	60·6	10·55	N.W. Westerly.
June	63·7	69·9	66·4	61·7	12·48	S.E. and N. Westerly.
July	63·7	74·2	67·5	61·5	6·87	N. Westerly.
August ...	64·5	72·8	67·7	61·0	4·38	S.E. and N. Westerly.
September	64·4	73·5	67·4	61·3	15·95	N.W. Variable.
October ...	64·7	73·4	67·5	61·8	10·97	N.W. E.S.E.
November	63·6	72·1	66·5	60·9	9·20	N.W. E.S.E. N.E.
December	61·8	70·4	65·2	59·0	2·10	N.W. and E.S.

The thermometrical observations made by Mr. Spruce, from June 19th to December 8, 1860 (the dry season), in the "red bark regions" of Ecuador, closely approximate to the preceding Table, as may thus be noticed:—

Mean minimum	61·5
Mean maximum	72·2
Mean temperature at 6 P.M.	67·8
Highest temperature observed	80·5
Lowest ditto	57·0
Entire range	23·5
Mean daily variation	10·5

some of our mountain districts, between 4500 to 5000 feet above the sea, where in one of the wood-covered valleys or ravines, watered at the base by tributary brooks or streams, an eligible clearance might be allotted for their future home. To preclude erroneous assumptions, it cannot be too strictly maintained in view, that the preceding investigations were merely of a provisional character, and instituted solely as a test to determine whether the island of Jamaica could not furnish indigenous cinchonoid remedies independently of those imported from foreign sources. These experiments again inculcate an encouraging prospect, that by the judicious cultivation of these products, a much greater elaboration of their alkaloid constituents may be educed than those furnished by the same trees in their primitive condition—a conclusion partially confirmed by the results of practical inquiries on the plants acclimated in India.

We now arrive at that portion of our subject more exclusively referring to the therapeutical value of the cinchona alkaloids, and, as a necessary sequence, the selection of those species of trees as may be considered more worthy of cultivation than others; points involving considerations of paramount importance. The investigation may be restricted to the two primary elements, quinine and cinchonine, respecting the medicinal powers of which some difference of opinion prevails among medical authorities. The inferiority of the latter salt, appreciated in the most favourable light, has been acknowledged to be one-third less in febrifugal virtue than the former. It will, nevertheless, cure the milder forms of intermittent and other ephemeral fevers dependent on various causes than a vitiated state of the blood, and also those febrile affections in which stimulant tonics are indicated; but when it is proposed to recommend it as an ordinary substitute for quinine, the question assumes a graver aspect. In a previous communication* to an able pharmacologist, Professor Bentley, of King's College and Pharmaceutical Society, London, Dr. Daniell stated the employment of this alkaloid in lieu of quinine at Sierra Leone had induced great vertigo and cerebral congestion to that extent as to compel him to discontinue its use; and we are led to understand, from further inquiries now in progress, he has found no reason to change or modify his former experience. In estimating the relative efficiency of these salts, he points out that two distinctive peculiarities must be specially retained in view, viz. the physiological or toxic power and the therapeutic or curative influence, between the effects of which on the human system a singular disproportion exists. Although more variable and uncertain in its action, the toxic or the stimulant properties of cinchonine are almost identical in effect with those of quinine; but beyond this the analogy ceases, for the results of experimental trials in West Africa and Jamaica indicate their remedial or curative influence to be, by comparison, as 2 to 5, while the reports of the French army surgeons on the same alkaloid are reduced so low as 3 to 10; that is, three times the quantity of the former is requisite to render it equal in efficiency to the latter salt. The Council of Health of the French Army had also, several years since, strongly insisted on the fact of the remarkable contrast maintained between the toxical energy of cinchonine and its therapeutic insufficiency. Now in the more intense or ataxic forms of tropical fevers, in which an accelerated pulse is associated with cerebral disturbance, whether proceeding from local congestion, circulation of poisoned blood through the brain, or gastric derangement, cinchonine, by its marked influence on the nervous centres, would both increase the heart's action and promote the retrograde metamorphosis of tissue without affording the means of elimination, and thus, by retention of these morbific elements, tend to produce an unfavourable issue. Again, in those depraved types of yellow fever, before morbid disintegration of the blood has permanently set in, or passive venous accumulations permeated the tissues, it is well known the critical stage comprehends but a brief interval for the sufferer to call in the aid of science to determine his fate, unless a decided impression be made at once on the constitution by febrifuge medicines, the symptoms insidiously progress, but are no longer those of vitality, they have imperceptibly assumed the more certain warnings of an approaching dissolution. These illustrations may be adduced, among others, to which the previous remarks are equally applicable. It is the toxic adjunct, so predominant in cinchonine, that often neutralizes the therapeutic effects of quinine, limits and impairs its utility, and induces constitutional irritation and excitement to that degree, as to contra-indicate its administration in many acute febrile maladies.

* Pharm. Journ., 2nd Ser. vol. iv. p. 512.

We have already briefly adverted to the affections in the treatment of which cinchonine may doubtless prove beneficial. The endemic influences of tropical climates differ according to their isothermal position, and with them the intensity and variation of the febrile phenomena, precisely as in temperate regions important modifications in the character and type of fevers from climatic vicissitudes are daily experienced. Hence, not a few of the successful cases of cure ascribed to the virtues of this alkaloid have been thought to be due rather to an earlier accession of the crisis in the less severe attacks, or to a spontaneous decline of the disease, than to the medicinal potency of the remedy. One of the chief military surgeons of France, M. Levy, after a varied series of observations on its reputed efficacy, thus conclusively sums up:—"No military physician has attempted the employment of cinchonine in the malignant fevers (*fièvres pernicieuses*), a reserve which is recommended by the results of experiments, and which ought to be imitated in civil practice."

We have now brought under the notice of our readers, so far as space will permit, a concise summary of the events connected with the experimental culture of the Cinchona plants in Jamaica, and appended those controversial points on the ultimate decision of which the selection of the species deemed most valuable for medicinal or therapeutic purposes will be based. We may, in conclusion, point out that these products, as they gradually become naturalized to their mountain homes, demand but a trifling amount of manual care or skill to secure their successful development, while the preliminary expense, or outlay, attending the introductory stages of growth would be comparatively insignificant.—*From the Jamaica Guardian.*

CINCHONA CULTIVATION IN CEYLON.

BY G. H. K. THWAITES, F.L.S., DIRECTOR OF THE BOTANIC GARDENS.

The cultivation of these valuable plants at the Hakgalle Garden continues to progress most successfully under Mr. M'Nicoll's unintermitting attention and care. Not the least doubt need now be entertained as to the climate of Ceylon being suitable for the growth of Cinchonas; their healthy condition at Hakgalle is all that can be desired. It is true that *Cinchona succirubra* requires to be planted in a somewhat sheltered situation, but it does not suffer so much from the wind as might be supposed from the texture and large size of its leaves. *Cinchona Condaminea* (or *Cinchona officinalis*, as it is now called) Mr. M'Nicoll reports as being much better able to withstand the influence of the wind, its leaves being of a moderate size, and of a firm consistence; and, as it requires a cool climate for its cultivation, those portions of the fine forests of the Central Province which are at too great an elevation for the successful cultivation of coffee, are well adapted for the growth of this species of Cinchona.

Through the liberality of the Government of Netherlands India, an important addition has been made to our stock of Cinchonas, by the contribution from the plantations at Java, of some healthy young plants of *Cinchona Calisaya:* out of fifteen plants received in January last, twelve reached to Hakgalle in fine condition, and Mr. M'Nicoll has been enabled, by striking cuttings from them, to increase the number very considerably.

As it was thought expedient that persons desirous of undertaking the cultivation of Cinchonas should have an opportunity, as soon as possible, of ascertaining whether the plant would succeed in situations contemplated for it, a limited number of plants of *Cinchona succirubra* was disposed of some months ago at the rate of 5*s*. each plant. The propagation of *Cinchona succirubra* and *Cinchona officinalis* having gone on rapidly at the Hakgalle Garden, since that time plants of these two kinds are now on sale there at the rate of 1*s*. each plant; and it may be expected that there will soon be a considerable demand for them, though the present prospect of coffee planting being so remunerating, must of course operate to some extent in giving a check to enterprise in other and new directions.

Mr. M'Nicoll reports to me that there is now at the Hakgalle Gardens the following stock of Cinchona plants:—

Cinchona succirubra, planted out in the forest........................... 250
(The largest plant being 10 feet high, with the stem 7 inches in circumference at the base.)

Cinchona succirubra. Stock plants, for taking cuttings from	1000
Do. Plants of good size, ready for distribution	5208
Do. Plants of small size	7362
Cinchona officinalis, planted out in the forest	100
Do. Stock plants, for propagation from by cuttings	1000
Do. Plants ready for distribution	3250
Do. Small plants	3188
Cinchona crispa (variety of the one preceding) stock plants for propagating from	141
Cinchona Calisaya, stock plants for propagating from	57
Cinchona micrantha, seeds received under different names, but plants not distinguishable specifically.) } planted out in the forest	300
Do. Stock plants for propagating from	190
Cinchona Pahudiana Ditto	4

In addition to the plants enumerated above, there are numerous cuttings in progress of striking; and this mode of propagation will now go on very rapidly from the number of healthy stock plants kept for the purpose.

A few healthy plants of *Cinchona succirubra* are still on sale at Peradenia.

In June last a very interesting Report was sent to the Under Secretary of State for India, by J. E. Howard, Esq., on the subject of an analysis he had made of bark, of the second year's growth, of *Cinchona succirubra* cultivated on the Neilgherries, the result of which analysis Mr. Howard considered extremely favourable, a very fair percentage of valuable alkaloids having been obtained. From a supply of dried leaves of *Cinchona succirubra*, sent to him by Mr. M'Ivor, Mr. Howard succeeded in obtaining quinine, but in such small quantity that he thought they would hardly supply a material for the profitable extraction of the alkaloid.* Dr. T. Anderson, Superintendent of the Calcutta Botanic Gardens, in a Report sent by him to the Under Secretary to the Government of Bengal, states that Dr. Collins, Civil Surgeon of Darjeeling, had, at his request, administered an infusion of *Cinchona succirubra* leaves, which had fallen off the in the plants spontaneously in the Nursery at Darjeeling, and that it had been found efficacious cure of cases of intermittent fever, without any other medicine whatever.

With these favourable reports as to the value of the plant, its useful properties being so easily and immediately available in a decoction of the fresh leaves or bark, it must be quite unnecessary to urge the desirableness of an extensive distribution, and of a certain number being cultivated on every coffee estate.

Some notes on the propagation and cultivation of the medical Cinchonas, by Mr. M'Ivor, have been published by order of the Madras Government. Experiments are yet wanting to ascertain the period of growth when the bark may be most profitably collected from the trees; also the best means of drying the bark when collected.—*From Report on the Botanic Garden at Peradenia.*

UTILIZATION OF BRINE.

At the usual meeting of the Philosophical Society of Glasgow this week, a very important paper was read by Alex. Whitelaw, Esq., 55, Sydney Street, entitled "A Practical Application of Dialysis." The paper set out with a detailed exposition of the discovery of, and experiments in, dialysis by Mr. Graham, of the Mint, after which Mr. Whitelaw stated the result of a process of his own for utilizing the brine of salted meat. When fresh meat, he said, had been sprinkled with salt for a few days, it was found swimming in brine. Fresh meat contained more than three-fourths of its weight of water, which was retained in it as in a sponge. But flesh had not the power to retain brine to that extent, and in similar circumstances it absorbed only about half as much saturated brine as of water, so that under the action of salt, flesh allowed a portion of its water to flow out. This expelled water, as might naturally be expected, was saturated with the soluble nutritive ingredients of the flesh; it was, in fact, juice of flesh—soup, with all its valuable and restorative properties. In the large curing establishments of

* 'Pharmaceutical Journal,' vol. v. pp. 74 and 367.

this city very considerable quantities of this brine were produced, and thrown away as useless. This was the material to which Mr. Whitelaw has applied the process of dialysis, and he thought with success, for the removal of the salts of the brine, and for the production, at a cheap rate, of pure fresh extract of meat. His process he stated as follows:—The brine, after being filtered to free it from any particles of flesh or other mechanical impurities it might contain, was then subjected to the operation of dialysis. The vessels or bags in which he conducted the operation might be made of various materials and of many shapes; but whatever might be their material or shape, he called them "dialysers." Such an apparatus as the following would be found to answer the purpose:—A square vat made of a framework of iron filled up with sheets of skin or parchment paper in such a way as to be water-tight, and strengthened, if necessary, by stays or straps of metal. The sides, ends, and bottom being composed of this soft dialysing material, exposed a great surface to the action of the water contained in an outer vat, in which the dialyser was placed. He found a series of ox-bladders fitted with stop-cocks, or gutta-percha mouth-tubes, and plugs, and hung on rods stretching across and into vats of water, a very cheap and effective arrangement. He could also employ skins of animals either as open bags or closed, and fitted with stop-cocks or bags of double cloth, with a layer of soft gelatine interspersed between them. Other arrangements would readily suggest themselves, and might be adopted according to circumstances. But supposing the bladder arrangement was taken, which he thought would be found practically the best, being cheap, easily managed, and exposing a great surface to the dialytic action. The bladders were filled with the filtered brine by means of fillers, and hung in rows on poles across, and suspended into vats of water. The water in those vats was renewed once a day, or oftener if required, and he found that actually at the end of the third or fourth day, according to the size of the bladders employed, almost all the common salt and nitre of the brine had been removed, and that the liquid contained in the bladders was pure juice of flesh, in a fresh and wholesome condition. The juice, as obtained from the "dialysers," might now be employed in making rich soups without any further preparation, or it might be concentrated by evaporation to the state of solid extract of meat. Mr. Whitelaw, at this stage, requested a friend present to heat a portion of the juice of flesh so as to produce a soup, and he asked the members to taste it and experience the result. He also had prepared more carefully a soup from the brine, to which he directed attention. (Both were found to be very palatable.) The brine used, he continued, was from one of the most respectable curing-houses in Glasgow, and was perfectly pure and wholesome. The liquid from the dialysers might be treated in several ways. It might be evaporated in an enamelled vessel to a more or less concentrated state, or to dryness, and in these various conditions packed in tins or jars for sale. It might be concentrated at a temperature of 120 degrees, by means of a vacuum pan or other suitable contrivance, so as to retain the albumen and other matters in a soluble form. Again, the more or less concentrated liquid might be used along with flour used in the manufacture of meat biscuits. The products he had named were all highly nutritive, portable, and admirably adapted for the use of hospitals, for an army in the field, and for ships' stores. The dialysis of brine might be conducted in salt water, so as to remove the greater portion of its salt, and the process completed in a small quantity of fresh rain, or other water. In this way ships at sea might economize their brine, and so restore to the meat in a great measure the nutritive power that it had lost in the process of salting. Thus then, Mr. Whitelaw said, he obtained an extract of flesh at a cheap rate, from a hitherto waste material. Two gallons of brine yielded one pound of solid extract, containing the coagulated albumen and colouring matter. For the production of the same directly from meat, something like twenty pounds of lean beef would be required. The quantity of brine annually wasted was very great. He believed he was considerably under the truth when he said that in Glasgow alone 60,000 gallons were thrown away yearly. If they estimated one gallon as equal to seven pounds of meat in soup-producing power, then this was equal to a yearly waste of 187 tons of meat without bone. Estimating the meat as worth sixpence per pound, this amounted to a loss of £10,472. In this way the waste over the country must, he said, be very great. In the great American curing establishments the brine wasted must be something enormous, as he found that in eight of the Federal States 4,000,000 pigs were slaughtered and cured last season. Mr. Whitelaw concluded by quoting from Gregory and Liebig as to the value and efficacy of extract of meat.

At the conclusion, several gentlemen expressed their approval of the paper, and the desirability of such a practical application of dialysis as that described by Mr. Whitelaw.—*North British Daily Mail*, Feb. 27, 1864.

HOW TO PRESCRIBE AND HOW TO WEIGH IN GRAINS.

Although the toils of practice have compelled us, as they have most of our readers, to look upon chemical manipulation as a thing only to be taken up on some rare occasions, yet, sitting with a good balance and set of accurate grain-weights in our study, we cannot help wondering why so many who prescribe and dispense, and why the Medical Council which issues regulations for both processes, should prefer an intricate and obscure system of weights to one that is simple and obvious at first sight to every one.

In our present remarks we confine ourselves to dispensing and prescribing; as for manufacturing, that is no business of the practitioner. The Medical Council have thought fit to give formulæ for the manufacture of drugs on the large scale, which manufacturers may laugh at or adopt, as they please; and for processes such as these, the pound, with its even binary divisions of half, quarter, eighth, etc., and the ounce, with similar divisions, may be convenient and sufficient.

But we do not prescribe pounds or ounces for our patients. *The real unit* for this purpose *is the grain*. Every one who prescribes knows how many grains or fractions of grains he wishes the patient to take; and whether he direct one dose or many to be made up, the necessary calculation is trivial, and involves no difficulty whatever. And it is far easier to write down any given number of grains at once, than it is to first reduce them to drachms, or fractions of drachms, or scruples.

It will be more convenient under this new system to use Arabic numerals than Roman. Most of us now write in English the directions how medicines are to be taken. We have done so, since a chemist's lad once translated "cyath. vin. aquæ," as "a glass of wine and water." The substitution of the Arabic numeral will be but one step towards abolishing Latin altogether, a thing which, however regretted, is inevitable.

Prescriptions are already half English. When we see "grs. xx.," we are fain to advise the prescriber not to jumble Latin and English together in one phrase, but to choose whichever of the two tongues he understands best, and write wholly in that.

Suppose, then, we wish to write a prescription for eight doses, each containing eight grains of carbonate of ammonia, ten of bicarbonate of potass, and fifteen of nitrate of potass,—

℞. Ammoniæ carb., gr. 64; potassæ bicarb., gr. 80; potassæ nitratis, gr. 120; aq. destillatæ, fl. oz. 8; m. ft. mist.

Sig.—"One fluid ounce by measure to be taken every four hours, with half a fluid ounce of lemon-juice, and the same of water."

Such a mode of prescribing quantities would answer every purpose. There could be nothing gained by writing "gr. lxiv.," nor yet "ʒj. et gr. iv.," instead of "gr. 64," and so with the other quantities. To use scruples or drachms and Roman numerals would be to get into a calculation for no other purpose than to get out of it again.

Suppose a man has to perform a simple chemical determination,—say, the solid contents of a decigallon of water from some water-works,—first he weighs a capsule, which equals, say, 413·98 grains; (2) after evaporating the water therein, and drying at 250°, it weighs 416·4 grains; (3) after drying still further, 416·35 grains. This number is adopted, giving as the total solid impurity, viz. the difference between the first and third weighing, multiplied by ten, as per gallon, 23·7 grains.

These results are seen at a glance. But what chemist, except his head were stuffed with straw, would write down, instead of the above figures, "Weight of capsule, ʒvj., ℈ij., gr. xiij., et xcviij. partes grani e centum; after evaporation, ʒvj., ℈ij., gr. xvj., et xxxv. partes grani e centum; weight of solid residue per gallon, ℈j., gr. iij., et septem partes grani e decem"?

If chemists do not vex their souls with these antique intricacies, why should we? But if the manner of expressing quantities in grains be easy, infinitely more so is the actual weighing, if, instead of the odious Apothecaries' weights, we have a set of plain grain-weights.

With the Apothecaries' weights they give ʒij., ʒj., ℈ij., ʒss., ℈j., ℈ss., besides grain-weights stamped to represent 6, 5, 4, 3, 2, and 1 grain.

It is practically difficult to distinguish between ℈ij. and ʒss., and it takes up a good deal of calculation to make up odd numbers of grains.

A box of good chemical grain-weights, on the contrary, has them in regular sets of four, out of which any combination can be made immediately by the simplest process of addition. The grain weights are made of wire, bent in such a way that each gives its value at a glance.

The highest set of weights, for hundreds of grains, is—600, 300, 200, 100. The next, for tens—60, 30, 20, 10. The third, for grains (of platinum wire)—6, 3, 2, 1. The fourth, for tenths (of platinum wire)—·6, ·3, ·2, ·1. Hundredths may be had in gold wire, but are not necessary, and tenths can seldom be wanted in dispensing.

It may be seen at a glance, first, that the series of "tens of grains" harmonizes with ʒj., ʒss., ℈j., and ℈ss., if any one loves the old system and chooses to use it. Secondly, that out of the above numbers any intermediate number can be formed. And it may be added, thirdly, that the custom of putting weights into the scale-pan in regular order is useful, like all other chemical processes, as a means of teaching exactness and order.—*Medical Times and Gazette.*

MISCELLANEA.

New Alkaloid from the Calabar Bean.—Messrs. Jobst and Hesse, of Stuttgardt, have instituted a chemical examination of the Calabar bean. They found the active principle to be contained in the cotyledons only. It was obtained by treating the beans with alcohol, and then acting by means of ether on the residue left after evaporation of the alcoholic solution. The ethereal solution after evaporation left pure *physostigmine.* Physostigmine is a brownish-yellow mass, amorphous, and in the first instance separated in the form of oily drops. It is easily soluble in ammonia, caustic and carbonated soda, ether, benzole, and alcohol; less soluble in cold water. From the ethereal solution it is entirely precipitated by animal charcoal. The watery solution has a faintly burning taste, a clearly alkaline reaction; it gives a copious kermes-coloured precipitate with biniodide of potassium, and a precipitate of hydrated oxide in solution of chloride of iron; fused with hydrate of potash, it evolves fumes which have a strongly alkaline reaction. Acids dissolve it easily, and yield solutions of salts, which have mostly a dark red, more rarely a dark blue, colour. The hydrochlorate of physostigmine yields precipitates, with tannic acid, reddish-white; chloride of platinum, pale yellow; chloride of gold, bluish—a reduction taking place; bichloride of mercury, reddish-white. Twenty-one beans yielded only a little alkaloid. Two drops of a watery solution of the alkaloid placed on the eye caused the pupil to contract, after ten minutes, to about one-twentieth of its original diameter. In this condition it remained for an hour; after from four to six hours it had again assumed its former size. Taken internally, physostigmine is as poisonous as the most dangerous cyanides. The alkaloid from one bean was given to a rabbit; five minutes afterwards it fell, remained motionless, and died twenty-five minutes later, or half an hour after the taking of the poison. Physostigmine causes contraction of the iris, even in the eye of an animal which has already been dead for some time. A rabbit's eye, treated with two drops of watery solution an hour after the animal had been killed mechanically, showed a contraction of the pupil to one-fourth of the other eye. A rabbit killed with physostigmine did not show this feature; but it was exhibited to a small degree by one which had been killed by cyanide of potassium. This shows that muscles, though dead, are yet liable to be influenced specifically, and not only by the galvanic current, but also by physostigmine.—*Ann. Chem. und Pharm.*, Jan. 1864, and *British Medical Journal.*

The Calabar Bean.—We learn from the 'Medical Times and Gazette,' January 16, that this agent has now found its way into the general hospitals, as a remedy in certain nervous affections. There is an interesting case of chorea in University College Hospital, a girl, aged eleven years, under the care of Dr. Harley. The commencing dose was one grain of the powdered bean, which was gradually increased to three grains three times a day, and even six grains was given for a dose once a day. The only disagreeable effects appear to have been occasional brief attacks of colic, and once or twice slight vomiting. The heart's action was greatly accelerated. The dose for an adult is stated by Dr. Harley to be three to six grains.

Arsenical Poisoning by Absorption.—On Saturday, February 27th, Mr. E. L. Gross, one of the coroners for Suffolk, concluded an inquiry into the death of a child named Boatman, the daughter of a small farmer at Wissett, near Halesworth. The deceased was aged 9 years, and lived with her father and stepmother. The child was taken ill, gradually got worse, and died soon after a medical man was called in. The surgeon (Mr. Howard), feeling satisfied that the child died from poison, refused to certify the cause of death. An inquest was accordingly held, and when the jury viewed the body the scalp of the head was found to be in a shocking state from ringworm, and covered with vermin. The stepmother stated that about ten days before the death of the child she applied some precipitate powder and a little poison in the shape of an ointment to the head, to kill the vermin. The coroner ordered a *post-mortem* examination, and the appearance of the intestines and stomach pointing to arsenical poison in some form or other, it was felt important to ascertain whether the child died from arsenical poison, and if so, how it was administered. The viscera were accordingly sent to Professor Taylor, who stated at the inquest that the child died from arsenic applied externally and absorbed into the system. The condition of the viscera, in their appearances, in the nature of their contents, and in the minute imponderable quantity of arsenic present in them, was not consistent with the supposition that arsenic had been given in a solid form or in a liquid form by the mouth, but it was quite consistent with the absorption of the poison through the skin of the scalp, and its subsequent diffusion by the blood. The scalp of the deceased was found to contain a large quantity of arsenic associated with a quantity of mercury (white precipitate), which had been applied as above stated in the form of an ointment. The jury returned a verdict to the effect that the deceased died from the effects of an ointment containing arsenic applied to her head by Mrs. Boatman, she being ignorant of the consequences, and intending merely to heal disease of the scalp; at the same time the jury desired the coroner to express to Boatman and his wife their sense of the neglect and ill-treatment of the deceased.

Explosion of Detonating Powder.—On Saturday evening, January 30th, a fata explosion took place at the shop of an oilman and tallow-chandler named Tripp, carrying on business in Havill Street, Southampton Street, Camberwell. One of his daughters named Anne, 30 years of age, was mixing with a knife a chemical composition, supposed to be phosphorus and detonating powder, although her sister had spoken to her several times, and pointed out the danger of using steel in mixing the composition. Suddenly a tremendous explosion took place. Miss Tripp was found with a knife in her hand, which had been partially blown away. She was much injured, and expired before she could be removed to St. Thomas's Hospital.

Deaths from Chloroform.—Two deaths from chloroform have occurred lately At Salisbury, an inquest was held on the body of a young woman, named Emily Luther who died under the influence of chloroform, administered by Dr. H. P. Blackmore, previous to an operation for fistula. The chloroform (ʒivss) was poured on a handkerchief and placed on the face, but removed previous to the operation, which lasted two or three minutes. From a *post-mortem* examination, it was shown that the liver was greatly enlarged, which diminished the breathing-space for the lungs, which were found to be extremely small, and gorged with blood. The jury returned a verdict, "That the deceased died from the effects of chloroform, administered by Dr. Blackmore. They were of opinion that although no blame could be attached to him for want of skill, yet for the future it would be advisable for a second medical practitioner to be present during the administration."

The second case was also that of a young woman (Ellen Smith), under the care of Mr. John Gay, of Finsbury, assisted by Mr. Worley. The operation was one for a hare-lip, and the chloroform was administered with an inhaler, but not having the desired effect, a piece of lint, saturated with chloroform, was applied to her nostrils. In three or four minutes, the usual spasms, which precede the loss of sensibility, were apparent, when the pupil of the eye was observed to dilate rapidly, and she fell back, pulseless. Artificial respiration and other means were tried, but without success. The coroner, in summing up, spoke in strong terms upon the omission of the medical men continuously to watch the pulse, for had the pulse been continuously attended to, the life in this case might probably have been saved. He considered it an error in judgment. The following verdict was returned:—"That Ellen Smith had died from the effects of chloroform ad-

ministered previous to an operation, and that there was no blame attached to the medical men."

Aqueous Extract of the Liver of the Cod.—M. Despinoy, of Lille, examining the fluid which escaped during the fermentation of the cod-liver in the preparation of the oil, found it richer in the properties found in the oil than the oil itself. He prepared an extract from the fluid, in order that it might be administered in the form of pills. M. Devergie recently reported to the Academy on the results obtained by several trials of these made in the Paris Hospitals. It was found that when the pills were given in great doses they caused anorexia, but given to young scrofulous subjects in moderate and prolonged doses, they improved the assimilatory powers very much, as is done by small doses of cod-liver oil; but in regard to their ultimate effect upon the special symptom they were found very inferior in efficacy to the oil. Still, as a remedy in cases in which the cod-liver oil cannot be borne in examples of chlorosis, anæmia, indigestion, and commencing phthisis, they may prove of great utility, it always being remembered that the same amount of therapeutical results is not to be obtained as from the oil. The mean dose of the pills is four per diem, commencing with one night and morning. M. Despinoy's researches prove that the peculiar active principle of cod-liver oil has yet to be sought for, as, while the watery extract is of less therapeutical power, it is richer in its proportions of propylamine, ichthyoglycene, iodine, phosphorus, etc.—*Bull. de Thérap.* vol. lxiii. p. 545.

Case of Alleged Poisoning.—Mr. Richard Oke Millett, surgeon, of Penpol, Cornwall, was charged before the magistrates of Hayle with having administered poison to his brother, Jacob Curnaw Millett, with intent to cause his death.

Some suspicions of foul play having arisen, and, on the information of Mr. William Millett (brother of the deceased) and Mr. Frederick Edmonds, surgeon, Sir George Grey gave an order for the exhumation of the body, certain portions of which were sent to Dr. Taylor for analysis. The evidence adduced at the several examinations was of the most trivial character; and at the last sitting, when the report of Dr. Taylor was received, the case completely broke down, and Mr. Millett was honourably acquitted. Dr. Taylor stated in his report, that not only was there a total absence of poison in any part of the body which he had examined, but, from the symptoms described, he should not have suspected it to have been a case of poisoning at all.

A New and Delicate Vegetable Reagent.—M. Goppelsroeder, of Bâle, has discovered a very delicate reagent in the extract of the petals of the mallow. The extract of mallow is violet, and it becomes red when treated by an acid. Paper is tinted with this extract, and it then may be employed in the same way as litmus or curcuma. The alkaline bases render this paper violet when their solutions are diluted, and green when they are more concentrated. If a solution contain only two-millionth part of caustic soda, the reagent becomes of a violet colour, producing effects when litmus and curcuma cease to do so. The alkaline nitrites furnish the same result.—*Bull. de Thérap.* No. 9.

Poison for Rats.—The 'Journal d'Agriculture Pratique' states that carbonate of baryta may be successfully employed for the destruction of rats. As the salt is tasteless, it may be mixed with various kinds of food; it only becomes poisonous by the action of the gastric juice, which renders the salts of baryta soluble.

Another Chrome Green.—A brilliant green for printing is said to be made in the following way:—Take 15 parts of bichromate of potash, 36 parts of crystallized phosphate of soda, and 6 parts tartaric acid. Fuse the phosphate in its water of crystallization, and add to it the bichromate rubbed to fine powder, and afterwards the tartaric acid. Great frothing takes place on the last addition, and the colour of the mass changes from yellow to green. A porous brown mass remains, which dissolves in hot water and dilute acids, giving an emerald green solution. The porous mass is to be moistened with as much strong hydrochloric acid as it will absorb; it is then treated with cold water to remove the acid, and afterwards with boiling water to dissolve out the soda and potash salts. An insoluble green body remains on the filter, which, when more finely divided by levigation, becomes of a brighter shade. The 6 parts of tartaric acid may be replaced with 14 parts of Rochelle salt.—*Chemical News.*

Phosphates in Medicinal Decoctions and Infusions.—Some researches made by M. Terreil show that plants contain the phosphates in a soluble state. If we pour a slight excess of acid into a well-filtered infusion of mallow leaves, or into a decoction of taraxacum root, the sides of the glass will within twenty-four hours be found lined with

ammoniaco-magnesian phosphate. All the phosphoric acid is not precipitated by this first deposit, and if we add to the filtered fluid sulphate of magnesia saturated by sal-ammoniac, a new deposit of the ammoniaco-magnesian phosphate occurs, and continues to increase. All vegetable solutions do not precipitate this phosphate when treated by ammonia, but they always do so when sulphate of magnesia saturated by sal-ammoniac is added. M. Terreil concludes from these facts that vegetable infusions and decoctions owe a portion of the action they exert on the economy to the phosphoric acid and phosphates they contain, the phosphate of lime of the bones proceeding from the soluble phosphates.—*Bull. de Thérap.*, vol. lxiv. p. 29.

Suicide by Prussic Acid.—Mr. C. J. Carttar, coroner for West Kent, held an inquest on Tuesday, October 27, at the Ashburnham Arms public-house, Greenwich. on the body of Jean Baptiste Boussion, aged 57, who committed suicide by swallowing a quantity of prussic acid (Scheele's strength). From the evidence taken, it appeared that the deceased was a native of Marseilles, and occupied an office at 13, Crutchedfriars, City, as a shipbroker. Five months since he engaged furnished apartments at Greenwich, for himself and a young woman, whom he represented as his wife, but who admitted that she was not married to him. On Sunday afternoon, October 25th, he sent this young woman, accompanied by a female servant, to London, instructing her to look at a house; and on their returning to Greenwich in the evening, and proceeding into the bedroom, the unfortunate man was found lying on the bed, quite dead. A small tumbler and a phial, the latter of which was labelled "Scheele's prussic acid, poison," were found. Mr. Scott, surgeon, of Greenwich, deposed to making a *post-mortem* examination, and said that death had resulted from the swallowing of prussic acid. He had known the deceased a short period, from the fact of his bringing a young woman, whom he represented to be his wife, to his surgery, and he prescribed for her. The deceased on those occasions informed witness that he had originally been educated for the medical profession, and named the medicine he (witness) prescribed. On Sunday, October 18th, the deceased again called at his surgery with the young woman, and on leaving asked witness to supply him with some prussic acid, which he said he wanted for the purpose of experimenting upon insects, and which witness supplied him with in the bottle produced. The jury, after a short consultation, returned a verdict, "That the deceased committed suicide while labouring under temporary derangement."

Accidental Poisoning by Arsenic.—An inquest was held at Kinnisid, Ennerdale, Cumberland, on Wednesday, February 24th, upon the bodies of Andrew Palmer, aged 16 years, and Anthony Fletcher, 14 years of age, who took some sheep-dipping powder in mistake for sulphur, and died on the following day. The deceased lads were farm servants, living at the house of a farmer named Proud, at Swinside. On Monday night they asked a servant girl, named Coulthard, to get them some treacle and brimstone to take. The girl, having obtained the keys from her mistress, took out of a cupboard a bottle which she thought contained brimstone. The boys took some of the compound mixed with treacle, and soon afterwards were seized with sickness. As another servant who had taken a little of the powder also became sick, the inmates of the house became alarmed; a doctor was sent for, and he found the two lads suffering from the effects of arsenical poison. They both died next morning. Mrs. Proud said the powder had been put into the bottle by herself on Monday under the impression that it was brimstone. She took it out of a brown paper parcel which was not labelled, and which she had had in the house for upwards of twelve months. It now turns out to have been a sheep-dipping powder, composed of sulphur, potash, and arsenic. The jury returned a verdict of "Accidental death."

Poisoning by Aconite.—An inquest has been held at Northampton, on the body of Mr. George Woodward, late partner in the firm of Harris and Woodward, Chemists, Gold Street, who died from the effects of Fleming's Tincture of Aconite. It appeared from the evidence that the deceased said he had taken the aconite by mistake for ipecacuanha wine; but as the former was kept in a cupboard at the back of the shop, and the ipecacuanha wine in the front shop, it was thought this could not have been the case. As a motive for taking the poison, it was shown that he had become very intemperate in his habits, in consequence of which it had been determined by Mr. Harris that the partnership should cease, and this had caused a good deal of annoyance. From the nature of the medical evidence adduced, it was clear that the deceased had died from the effects of aconite, and the Coroner pointed out to the Jury that the question they

had to decide was, whether the poison was taken wilfully or by mistake. The jury returned a verdict to the effect that the deceased destroyed himself by taking aconite, whilst in a state of temporary insanity.

Fatal Petroleum Accident.– An explosion of American oil, attended by loss of life, took place at the village of Oxenhope. Mr. John Parker, a small shopkeeper there, some time since purchased a barrel of petroleum, which is said to have been sold as Young's patent paraffin oil. Requiring to use a portion of it, he was in the act of raising the cask to a convenient place upon the counter, where a candle was burning. When about half a yard away from the light a leakage was observed, and in an instant a loud explosion oocurred, blowing Mr. Parker completely through the doorway. The whole house was quickly enveloped in flames, Mrs. Parker and two sons were thrown down with great violence. The mother on recovering her feet snatched up her infant, and passing through the fire, gained the road with but little injury. The sons—John William, aged seventeen, and Olbin, eleven—made for the stairs, and succeeded in reaching a side bed-room on the first floor. The eldest jumped out of the window, and was picked up apparently lifeless. He has since returned to consciousness, but lies in a very dangerous condition. The younger son was overpowered in the attempt to follow his brother, and sank upon the room-floor dead. Two daughters, Ann and Florence, aged respectively four and six years, were asleep in bed at the time in a room immediately over the shop. They were found dead, and, from the appearance of the bodies, they must have died instantly from the effects of the gas given off after explosion. Mr. Parker was also badly burnt.

Another terrible explosion of petroleum is reported to have taken place lately. When a vessel with a cargo of petroleum was proceeding along the Welland canal, an explosion took place which was heard for miles around. All the men were blown into the air, and the captain and three of the men were drowned.

BOOKS RECEIVED.

THE PRESCRIBERS' ANALYSIS OF THE BRITISH PHARMACOPŒIA. By J. BIRKBECK NEVINS, M.D. Lond., etc. London: John Churchill and Sons, New Burlington Street. 1864. This little work contains a list of medicines and preparations introduced into the British Pharmacopœia, which were not previously in either the London, Edinburgh, or Dublin Pharmacopœias, with their doses and properties; a list of important alterations of strength or composition in those which still retain their old names unchanged; also a list of substances and preparations omitted from the present, which were formerly in the London, Edinburgh, or Dublin Pharmacopœias. The differences between these latter works and the British Pharmacopœia, including additions, omissions, and alterations, are also indicated. In the directions given relating to doses, etc., some ambiguities will be observed, as for instance, under *Liquor Ammoniæ Acetatis* we find "*Dose*, f ʒss to f ʒv in an f ʒviij mixture," and the term "dose" in the directions given for the use of the *Liniments* is not a happy one. Notwithstanding a few ambiguities, the work will be found a useful guide to the British Pharmacopœia.

DR. HERAPATH'S ADDRESS ON CHEMISTRY, IN ITS RELATIONS TO MEDICINE AND ITS COLLATERAL SCIENCES. Bristol, 1863. (*From the Author.*)

A TABULAR VIEW OF THE RELATIVE STRENGTHS OF SIMILAR PREPARATIONS WHOSE ACTIVITY HAS BEEN ALTERED IN THE NEW BRITISH PHARMACOPŒIA, FOR THE PURPOSE OF FACILITATING THE LABOUR OF THE PRESCRIBER. (*From Messrs. Bewlay, Hamilton, and Co., Dublin.*)

A TOXICOLOGICAL CHART, EXHIBITING AT ONE VIEW THE SYMPTOMS, TREATMENT, AND MODES OF DETECTING THE VARIOUS POISONS, MINERAL, VEGETABLE, AND ANIMAL; to which are added Concise Directions for the Treatment of Suspended Animation. By WILLIAM STOWE, M.R.C.S.E. Twelfth edition, revised. London: John Churchill and Sons.

TRANSACTIONS OF THE MEDICAL AND PHYSICAL SOCIETY OF BOMBAY, for the year 1862. Bombay. 1863.

TO CORRESPONDENTS.

The British Pharmacopœia.—We learn from the 'Lancet' that at a meeting of the Royal College of Physicians, held March 21st, the President stated that "he had not been able to master the details of the new Pharmacopœia, and he understood that many of the Fellows were in a similar predicament. He recommended them to follow his example in the meantime, and to prescribe according to the London Pharmacopœia, writing the words '*Pharmacopœia Londinensis*,' or some abbreviation of them, at the top of the prescription." Our readers will be glad to find themselves thus relieved from considerable difficulty and trouble in ascertaining the intention of prescribers.

M. P. S. (Reading).—We are not acquainted with the ointment referred to; in fact, we can scarcely decipher the name as written by our correspondent.

A Student (Rochdale).—We are unable to state the exact time when the smaller edition of the British Pharmacopœia will appear.

J. W. (Piccadilly).—*Phosphorus Paste.* Vol. XII. page 402.

J. T. S. (Leeds) wishes to know "how to make ink (any colour) that will be visible two or three days, and then disappear without being exposed to light."

Chemicus (Torquay).—*Red Colours for Shop Windows.* See Vol. III. page 341, and Vol. X. p. 92.

J. C. Pooley (Bath).—Under the heading of "British Pharmaceutical Conference," your request has been attended to.

C. A. Z.—Write to the Secretary, 17, Bloomsbury Square, and he will then forward you all the particulars you require.

W. S. C. (Windsor).—Apply to the Secretary of the Pharmaceutical Society.

An Associate (Plymouth).—Bentley's 'Manual of Botany,' price 12*s.* 6*d.*

R. A. (Sheffield).—A new edition is in course of preparation.

Inquirer.—It is competent to the Council to restore any defaulter to his former status in the Society, on payment of arrears.

Wanted,—May, June, July, and August numbers of the Journal, 1852; full price given. Apply to Mr. Bremridge, 17, Bloomsbury Square.

Vir.—(1) See answer to *An Apprentice* (Hereford) in our last number. (2.) *Permanganate of Potash* is considered to be a *disinfectant* and *deodorizer*.

E. M. H. (London.)—(1) *Tincture of Larch Bark.* See Vol. XVIII. page 36. (2) The Chloric Ether in general use previous to the publication of the British Pharmacopœia, was about double the strength of the Spiritus Chloroformi; therefore the latter should not be used for Chloric Ether, as ordered in old prescriptions.

A. Z.—The bark forwarded is not Calisaya Bark, but a kind of Carthagena Bark which is commonly termed Coquetta Bark, and is the product of *Cinchona lancifolia* of Mutis. It is one of the barks mentioned in the Materia Medica of the British Pharmacopœia, and which is stated to be employed in the preparation of Sulphate of Quinia.

Studens (Birmingham).—An abridged edition of Pereira's 'Materia Medica' is advertised to be ready in October. It will be especially adapted to the use of pharmaceutical and other students of Materia Medica. Dr. Farre is the editor, and is assisted by Professor Bentley, and Mr. Warrington, of Apothecaries' Hall, London.

Mr. Joseph Leary (Bath); *Mr. Houlton* (Wetherby); *Mr. H. Crofts* (Chatham); *Dr. Faulkner* (Auburn, U. S. A.); *Mr. Whitelaw* (Glasgow), are thanked for their communications.

The Proposed Medical Bill of the Medical Council.—We observe an announcement in the medical journals that the Branch Medical Council for England, having deliberated on the proposed amended Medical Act, have come to the conclusion "that it is not expedient at the present time to engage in fresh legislation."

Instructions from Members and Associates respecting the transmission of the Journal before the 25th of the month, to Elias Bremridge, Secretary, 17, Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Messrs. Churchill, New Burlington Street. Other communications to the Editors, 17, Bloomsbury Square.

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. V.—No. XI.—MAY 1st, 1864.

THE PROPOSED LEGISLATION AFFECTING PHARMACY.

In another part of our Journal will be found the Bill which has been prepared by the Council as an extension of the Pharmacy Act of 1852; the Bill which, if passed, will render compulsory the submission of future chemists and druggists to examination before they are permitted to commence business as dispensers of medicine under the prescriptions of medical men. To have asked the Legislature to grant authority of the same kind over those who only sell drugs or chemicals in their simple forms would have been considered too great an interference with trade. Rhubarb and senna are as much legitimate articles of commerce as tea and coffee. It is true that, as our contemporary the 'Lancet' suggested a fortnight since, it would be highly desirable to entrust the sale of dangerous poisons to persons only who by knowledge of their properties could appreciate and mitigate the danger; but the difficulty of drawing a line between *virulent poisons* and *powerful medicines* has hitherto baffled all attempts at legislation in that direction, and we should perhaps risk desirable propositions which are attainable by combining them with others which, although desirable, seem at present to be unattainable. Virtually, we believe greater safety will arise indirectly from this Bill even in the sale of poisons, inasmuch as the public will in due time understand more fully the security given them by the examination and registration of chemists and druggists; and as they do so, the occupation of the unqualified vendors of physic will cease. Already the better informed classes know that the title of pharmaceutical chemist implies something more than a mere desire on the part of its possessor to assume a high-sounding name; and although some persons will always be found careless or credulous in such matters, they will be the exceptions we think to the ordinary rule, just as we now find that a few individuals are satisfied to trust their lives and limbs in the hands of quacks and bone-setters rather than physicians and surgeons.

Legislative language is always obscure, and we propose therefore to give a description of the provisions of the Bill, which shall be more clearly comprehensible than the mere marginal descriptions of its various sections, or than the text of the Bill itself to the generality of non-legal minds. We may premise that the Council was asked by chemists and druggists, not members of the Pharmaceutical Society, to endeavour to obtain a new Bill, or an extension of the Pharmacy Act, which should—

Render compulsory the examination of all persons commencing the business of chemists and druggists hereafter;

Reserve the vested rights and interests of chemists and druggists already in business at the time of its passing into law;

Give to the whole trade a full and fair representation in its governing body; and—

Protect the present chartered rights of the Pharmaceutical Society.

These four bases of operation are in themselves just and reasonable, and should be met, we think, in a fair and liberal spirit by our Society, which, from its twenty years' experience, its organization, its legal standing, and (we hope we shall not be thought vain in adding) the high position of many of its members, now occupies the vantage ground, and is recognized by the Legislature, the medical profession, and the trade, as the one Pharmacy Board of the kingdom.

Taking the Bill then as now published in our Journal, we may paraphrase it thus:—

The duty of dispensing medicines is so important, and the danger of its being performed by uneducated persons so great, that for the safety of the public it is necessary that all who undertake it should be specially educated for that purpose; and that the public should have some means of knowing who are, and who are not, qualified for their service, an examination shall be enforced, a register kept, and a special title given to those who may in future compound medicines: therefore—

After the 1st day of January, 1865, no person shall commence business as a dispensing chemist unless he shall have been examined by the examiners appointed under the Pharmacy Act of 1852, and have received a certificate from them that he is qualified to be placed on the register of chemists and druggists.

But inasmuch as chemists and druggists who are already in business have obtained a vested interest in the trade, of which it would be unjust to deprive them, and it may be assumed from their experience that they are qualified, this provision shall in no way lessen their rights and privileges, but on the contrary, those rights and privileges shall be confirmed and perpetuated by placing such persons on the register also; and on their part it is only required that they shall make a declaration, accompanied by the attestation of a duly qualified medical practitioner, that they were in business as dispensers prior to the 1st of January, 1865, and that they pay a sum *not exceeding* one guinea for such registration.

And as there are many men employed as assistants to such chemists and druggists, some of whom have been many years so employed, their privilege of commencing business for themselves at some future time without undergoing examination shall be preserved also, and they shall be placed on the register of assistants, on making application for that purpose, and bringing the certificate of two persons that they were so employed prior to the 1st of January, 1865, the fee for such registration being five shillings; and all persons whose names are on that register will be entitled on commencing business to be placed on the register of chemists and druggists on payment of a fee not exceeding one guinea: this exemption is limited to persons who shall have attained the age of twenty-one years.

That the Registrar may keep a correct register, he must have evidence of qualification before placing any name on it; and that he may, from time to time, erase the names of persons who have died, or alter the addresses of such as may have changed their residence, he may write letters to registered persons for information, and if such letters are not answered within six months, he will be at liberty to strike off the name; but if the party so struck off can show cause, the Council of the Pharmaceutical Society can restore him to registration. If the Registrar refuse to place the name of any applicant on the register, appeal may be made to the Council; and if he place any name there improperly, the Council may, by order in writing, cause it to be removed. If he wilfully falsify the register he shall, on conviction, be liable to imprisonment; and if any person shall wilfully, by

false or fraudulent representation, be registered, or seek to be registered, he too shall be liable to imprisonment. And if, after the passing of this Act, any person who is not registered under the Pharmacy Act of 1852 or this Act, shall keep open shop for dispensing the prescriptions of duly qualified medical practitioners, he shall be liable to a penalty of five pounds; and if any person who keeps open shop for compounding or selling drugs by retail shall falsely pretend that he is registered, or is a pharmaceutical chemist or chemist and druggist, he also shall be liable to a penalty of five pounds. The fees for examination and registration shall be payable to the Pharmaceutical Society, which provides the working machinery for carrying out this Act; the penalties as the Commissioners of Her Majesty's Treasury may direct.

Such is the scope of the statutory clauses as far as regards examination and registration, but then it is right that all persons should have a voice in their governing body; therefore, every person registered as a chemist and druggist by virtue of examination shall be eligible for election as an Associate of the Pharmaceutical Society, and as such he shall be entitled to attend, take part in, and vote at all meetings of the Society.

And to extend the benefit of the Benevolent Fund which has been established by the Society, and which can now only be administered to persons who are *actually* connected with the Society at the time of application, or to the widows or orphans of persons who were so connected up to the time of their death, it shall be lawful to relieve therefrom all persons who are, or ever have been, registered under the Pharmacy Act of 1852 or this Act.

The rights and privileges of duly qualified medical practitioners shall in no way be affected by this Act.

Here, then, is the Pharmacy Bill of 1864. Our readers will see that the only provision added since "the heads" of it were read at the Special General Meeting is the one which reserves to assistants the right of commencing business without undergoing examination; this has been added in compliance with the resolution passed at that meeting. The Bill provides for an efficient examination of future chemists, and thus ensures the safety of the public; it protects the vested interests of men already engaged in the business (whether as principals or assistants), gives them a better position, and by enforcing the examination of all who are hereafter to enter, will improve the general condition of the trade.

The two other bases of operation which we mentioned at starting, viz. the full and fair representation of the trade in the governing body, and the chartered rights of the Pharmaceutical Society, seem to be intimately connected with each other and have been much considered in the Council; it is because these two points are so intimately connected that the Council has found some difficulty in dealing with them. The expression of opinion at the Special General Meeting of the 17th of March, certainly appeared to be in favour of admitting chemists and druggists to membership who are now in business on their own account, but who have not thought it wise to bear the heat and burden of the day of foundation; for whatever powers may be obtained now will be based upon the foundation which the Society has been consolidating during the last twenty-three years. But that Meeting was called for a special purpose, *to consider the expediency of applying to Parliament for an extended Pharmacy Act which should make the examination of future chemists compulsory instead of optional*, therefore the Council could take no authority from that meeting as to the admission of members. Absentees might have said that no notice of such business was given. The Council, although endowed with large powers, and bound to exercise its judgment, even in executing the wishes of the Society, must confess itself after all but a representative body, holding in trust the *rights, privileges*, and *honour* of the

Society, and bound to protect every one of them until the deliberate will of the whole corporation be ascertained.

It is for this reason that we wish especially to bring under consideration of the Society questions which may and will arise at the General Meeting on the 18th inst. Any resolution passed thereat must be considered as a legitimate vote of the whole body, inasmuch as that will be a meeting for *general purposes*, previous intimation of any proposition to be made thereat being unnecessary.

But although previous intimation is unnecessary, it happens on this occasion to have been given, through the medium of this Journal, in a letter which we print this month from Mr. Orridge.

Now for the Society there can be no more important question than the admission of members. At its formation it was necessary to form a basis by incorporating those chemists and druggists who, recognizing the importance of qualification, were willing to give their *money*, their *influence*, and their *time*, for the furtherance of that object; the Pharmacy Act recognized those men as the founders, and established a new class wherefrom the Society should in future be augmented, making it at the same time the examining and registering board, but "*Pharmaceutical Chemists*" and "*Assistants*" might, or might not, ally themselves to the Society as "*Members*" or "*Associates*." Still, with the voluntary principle only to aid it, the Society, justly regarding itself as "*a means to an end*," has admitted no members or associates since 1853, except those who had previously taken their legal standing, by examination, under the Act. When a proposition was made to admit members by "*certificate of fitness*," the reply was prompt, and decided that such a proceeding would be unjust to those men who had submitted to examination, and the Society had no equivalent to give them in return for the concession. At this moment there is an equivalent to offer, viz. the compulsory examination of all men who are to enter the trade hereafter, not simply those who may assume certain titles, but of all who shall keep open shop for the dispensing of prescriptions. This is an important equivalent, and it becomes us to consider well whether, still regarding the Society as "*a means to an end*," it would not be wise to make the concession in order to attain the end—the *long-desired compulsory examination*. No legislation can be retrospective; it is not sought to submit men already in business (whether as principals or assistants) to examination, and it may be said that their registration as chemists and druggists is an ample protection of their vested interests; but should we not greatly facilitate the working of the compulsory Act, if in its infancy we brought the whole body of chemists and druggists into union; should we not enlist their sympathy in our objects; and is not the chief of those objects the education of future pharmaceutists? This may seem something like beginning again *de novo*, and to a certain extent this will be an actual beginning,—we mean so far as our compulsory powers are concerned.

There is one thing probably which we are bound to protect even more carefully than membership, *i. e.* the title of "*Pharmaceutical Chemist*" granted under the Pharmacy Act, and that might be kept as an inducement to lead men on to the higher examination. We believe this would be fair, just, and politic. It would be easy to make chemists and druggists already in business members of the Society, with all its privileges of voting, etc., but to bar the highest title against all who cannot demand it on the one irresistible plea of qualification.

APPOINTMENT OF LOCAL SECRETARIES.

About this time last year a new arrangement was adopted for the appointment of Local Secretaries to the Pharmaceutical Society, and this arrangement is now again coming into operation for the second time. It is very desirable in all localities where there are several members of the Society, that one should be appointed to represent the whole, to communicate when necessary with the Secretary in London, to give official information respecting the Society, and the means of obtaining admission into it, and otherwise to promote the interests of members in the locality represented, as well as those of the Society at large.

The arrangement contemplates the nomination of Local Secretaries by members in the towns or districts in which they are to act, subject, however, to the approval of the Council. With the voting paper for the election of Council, there will be sent to each member qualified to vote a paper relating to the election of Local Secretary, in which the voter is requested to insert the name of the person he considers most suitable for appointment as Local Secretary in his district. This, of course, will only be done where there is a sufficient number of members in the town or district to render such an appointment desirable. The papers are not to be signed by the voters, any more than the voting papers for election of Council, and therefore the voting in both cases will be by ballot. Both papers are to be enclosed to the Secretary in London, and they will be examined by the Scrutineers, who at the same time that they report the result of the voting for the Council, will render a statement of the votes given for Local Secretaries.

At the present time it is important to fill up as completely as possible the list of Local Secretaries, and to have such a list as shall well represent the several towns and districts throughout the country. In many cases the appointment of Local Secretaries has been made solely by the Council, because they have received no intimation from the members of their wishes in the matter; but of course the Council are often unable to select the fittest men for the appointment without such assistance as the members are alone able to afford in their several localities.

There is much important assistance which can be rendered by the active cooperation of Local Secretaries in the working of the Society. Thus, for the registration of apprentices it is necessary that they should pass the classical examination, and this may be conducted in country places wherever a suitable person can be found to conduct the examination. It is through the Local Secretaries that the Council can best select and recognize classical examiners, and through the same medium all the necessary information required by apprentices and others, relating to the Minor and Major examinations, should be furnished. The lists of Pharmaceutical Chemists entitled to exemption from serving on juries should also be revised by these officers. To enable them to perform these duties they are, immediately after their appointment, supplied with copies of the Charter, Act, Bye-laws, Register of Members, Examiners' Regulations, and other documents relating to the proceedings and government of the Society.

Last year the returns that were sent in compliance with the new regulations were pretty general, and they enabled the Council to prepare a new and extended list of Local Secretaries; but there was still room for further extension, and several towns were left without any appointment having been made by the members resident there. It is to be hoped that on the present occasion the voting papers for Local Secretaries will be more generally filled up, so as to give full effect to this very important part of the organization of the Society.

TRANSACTIONS
OF
THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *April 6th*, 1864,

Present:—Messrs. Bird, Davenport, Deane, George Edwards, Hanbury, Haselden, Hills, Meggeson, Morson, Reynolds, Sandford, and Waugh,—

The following were elected

MEMBERS.

Lewisham ....Thompson, Morley.
London ....Brown, Robert Thomas.
" ....Morris, Henry.
" ....Alexander, William.
Peterborough.................................Sturton, John Rowland.
Wolverhampton ....Hamp, John.

The following, having paid their arrears and their respective registration fees for the current year, were

RESTORED TO MEMBERSHIP:—

Basford.......................................Cutts, John.
Bath ....Walker, Henry John.
Oldbury ....Tonge, Charles.
Westbury.....................................Taylor, Stephen.
Wymondham ....Skoulding, William.

SPECIAL MEETING OF THE COUNCIL, *April 19th*, 1864,

Present:—Messrs. Bird, Davenport, J. B. Edwards, Haselden, Hills, Morson, Proctor, Sandford, and Savage.

The proposed Amended Pharmacy Bill was considered, and ordered to be printed in the ensuing number of the Journal.

BENEVOLENT FUND.

A second donation of Twenty Pounds was granted to an aged widow of a Member of the Society, and the following subscriptions, amounting to £47. 0*s*. 6*d*., were announced as having been received during the month of March.

Attwood and Hugill, 61, Cannon Street	£1	1	0
Abraham, John, Liverpool	1	1	0
Arnold, Edward, Norwich	0	5	0
Allchin, Alfred, Richmond Road, Barnsbury	0	10	6
Bourdas, Isaiah, Pont Street	1	1	0
Bradley, John, 21, Belgrave Road	0	10	6
Bird, William L., 42, Castle Street East	0	10	6
Betts, John, Woodbridge	0	2	6
Bowerbank, J. and F., Cockermouth	1	1	0
Bevan, Charles F., Harwich	0	5	0
Boyce, J. B., Chertsey	0	5	0
Bolton, Thomas, Tenterden	0	5	0
Buck, Thomas, Kingsland Green	0	10	6
Balmer, Jno., 94, St. John Street Road	£1	1	0
Cocksedge, Henry B., Bucklersbury	0	5	0
Cartwright, William, Newcastle-under-Lyne	0	10	6
Cooke, John, 171, Hoxton Old Town	0	5	0
Coles, John, New Road, Camberwell	0	10	6
C. W. J., Oxford Street	0	10	6
Dinneford and Co., 172, New Bond Street	2	2	0
Davies, Henry E., 43, Wood Street, City	0	10	6
Darby and Gosden, Leadenhall St.	4	4	0
Evans, John H., 60, Bartholomew Close	1	1	0

Forrest, Richard, Westbourne Grove	£0	10	6
Fox, William, Bethnal Green	0	10	6
Goode, Thomas, 47, Minories	5	5	0
Gristock, Thomas, Manchester Square	0	10	6
Gale, Henry, Camden Town	0	10	6
Gedge, William S., 77, St. John's Street	0	5	0
Hamp, John, Wolverhampton	1	1	0
Horncastle, John, 12, Stanhope Terrace, Hyde Park	0	10	6
Howell, Thomas, 81, High Street, Camden Town	0	10	6
Huxtable, John, 104, St. John Street Road	1	1	0
Hills, Thomas Hyde, 338, Oxford Street do.	1	1	0
Barnard, John „	0	10	6
Gale, Samuel „	0	10	6
Middleton, Francis „	0	10	6
Argles, Robert „	0	5	0
Benger, Frederick B. „	0	5	0
Fletcher, John „	0	5	0
Haddock, George J. „	0	5	0
Hardy, Samuel C. „	0	5	0
Machray, William „	0	5	0
Miller, Frederick C. „	0	5	0
Paine, Standen „	0	5	0
Peele, Henry A. „	0	5	0
Spearing, James „	0	5	0
Saunders, Albert J. „	0	5	0
Umney, Charles „	0	5	0
Wigg, Henry John „	0	5	0
Johnson, Benjamin M., 70, Tottenham Court Road	£0	5	0
Linsley, Thomas, York	0	5	0
Large, John H., 2, Holt's Place, New North Road	0	10	6
Merrell, James, 1, Queen's Terrace, Camden Villas	0	10	6
Moore, James L., Craven Place, Westbourne Terrace	0	10	6
Mercer, Nathan, Liverpool	0	10	6
May, John, Battersea	0	10	6
Mitchell, John, Upper Street, Islington	0	10	6
Nicholson, Frederick, St. Paul's Road, Highbury	1	1	0
Owles, John Edward, Aldeburgh	0	10	6
Pocklington, James, Sydenham	0	10	6
Peat, Walter, Fareham	0	5	0
Pedler, George S., 199, Fleet Street	1	1	0
Penrose, Arthur W., 7, Amwell Street	0	5	0
Palmer, Robert, 35, Ovington Square	1	1	0
Redfern, John, Ashby de la Zouch	1	1	0
Sims, John F., 8, Hemingford Place, Barnsbury	0	5	0
Skoulding, Wm., Wymondham	0	5	0
Thomas, James, Bridge, Kent	0	5	0
Tomlinson, Charles H., Lincoln	0	5	0
Wilson, Thomas, Upper Holloway	0	10	6
Wright and Francis, 11, Old Fish Street	1	1	0

EXAMINATION, *April 20th*, 1864.

MAJOR (Registered as Pharmaceutical Chemists).

Davenport, John Metcalf ....London.
Pochard, Ernest François Marie ....Mauritius.
Scruby, William Yull..............................Romford.

MINOR (Registered as Assistants).

Chambers, James....................................Belper.
Davies, Moses Prosser..............................Newcastle Emlyn.
Faulkner, James ....London
Gilling, John ....Lincoln.
Hitchcock, Charles Garrad.... ....Oxford.
Hyslop, John Cahill ....London.
Judson, William ....High Wycombe.
Mathias, Henry Lewis ....Newport.
Orpe, Thomas Mansell ....Derby.
Rider, Frederick ....London.
Shaw, Benjamin ....Wakefield.

REGISTERED APPRENTICES.

NAME.	RESIDING WITH	ADDRESS.
Anderson, John Brown	Mr. Rogerson	Bradford.
Cowle, Thomas Wright	Mr. Mays	South Shields.
Jones, Cynric	Mr. Ellis	Abergele.
Kingerley, William Strickland	Messrs. Shadford & Co.	Spalding.
Pierce, William George	Mr. Dresser	York.
Sharpe, Leonard George	Mr. Sharpe	London.
Solomons, Francis	Mr. Lamplough	London.
Woodstock, Charles Edward	Mr. Hawkins	Southampton.

EXAMINATION IN EDINBURGH, *April 12th*, 1864.

MAJOR (Registered as Pharmaceutical Chemists).

Buchanan, James	Edinburgh.
Buck, Jonathan Marsden	Liverpool.
Macdonald, John	Lasswade, N.B.
Macfarlane, Andrew Y.	Edinburgh.
Thomson, Charles	Elie, N.B.
Watson, Richard Thomas	Bishopwearmouth.

PHARMACEUTICAL MEETING.

Wednesday, April 6, 1864.

MR. SANDFORD, PRESIDENT, IN THE CHAIR.

The following

DONATIONS TO THE LIBRARY AND MUSEUM

were announced, and the thanks of the meeting given to the donors thereof:—

The Chemical News.
The Chemist and Druggist.
The British Journal of Dental Science.
The Photographic Journal.
The Educational Times.
The Technologist.
The Veterinarian.
The Medical Circular.
The Journal of the Society of Arts.
The Journal of the Chemical Society.
Bulletin de la Société de Chimie de Paris.
Kaiserliche Akademie der Wissenschaften in Wien; die Proceduren. Nos. 6–8. From the respective Editors.

Detailed Catalogue of Commercial Products and Specimens in the Trade Museum of Mr. P. L. Simmonds. From the Author.

A Description of the Symptoms and Treatment of Poisons principally used in the Punjab. By T. E. B. Brown, M.D. From Mr. C. Hewlett.

Handbuch der Pharmacognosie, von Dr. A. Wiggers. From the Author.

Proceedings of the American Pharmaceutical Association for 1863. From the Association.

The PRESIDENT wished to correct an error which had occurred regarding the last meeting, not in the minutes which had just been read, but in the report published in the Journal. He was therein reported to have said that Barth's apparatus for the administration of oxygen was "*clumsy, difficult to use,* and *very expensive.*" This was entirely contrary to his opinion. It would be remembered by gentlemen present, that when Mr. Robbins had read his paper on Oxygennesis, some mention was made of the difficulties which had hitherto attended the administration of oxygen; and he (the President) had

then stated, that having recently been called on by a physician to supply oxygen for a patient, he had procured a Barth's apparatus and found it extremely convenient and easy of management; that by a graduated rod attached to the cylinder, the proportions of oxygen and atmospheric air could be regulated with the greatest accuracy; and when some objection was raised as to its expense, he had replied that the apparatus might be *hired* for a moderate charge. He would not have trespassed on the time of the meeting with this explanation, but that he felt it due to the inventor of so excellent an apparatus that the error should be corrected in the place in which it had been reported to have been made.

ON THE PREPARATION OF TINCTURES,

BY PERCOLATION, MACERATION, AND THE AUTOMATIC PROCESS, WITH REMARKS ON THE NEW METHOD INTRODUCED IN THE BRITISH PHARMACOPŒIA, AND SUGGESTIONS FOR ITS IMPROVEMENT.

BY THEOPHILUS REDWOOD, PH.D., F.C.S.,

PROFESSOR OF CHEMISTRY AND PHARMACY TO THE PHARMACEUTICAL SOCIETY.

The introduction of a new process for the preparation of tinctures which has been adopted for most of the tinctures in the British Pharmacopœia, while other similar preparations described in that work are directed to be made by processes differing not only from it, but also to some extent from each other, seems to render the present a suitable time for discussing the relative merits of the several processes for the production of this, the most numerous and not the least important class of preparations used in medicine.

Of the two principal processes hitherto employed in the preparation of tinctures, one only, namely maceration, has been recognized in the London and Dublin Pharmacopœias. The other process, that of percolation, was sanctioned by the Edinburgh College in their Pharmacopœia of 1839, and it has also been largely applied by some practical pharmaceutists in operations to which it has been found applicable.

The process of percolation or displacement was introduced in pharmacy about thirty years ago, and was first brought under the notice of the Pharmaceutical Society by Mr. Deane. Since that time its use has been gradually extended both abroad and in this country, but although it has been generally admitted that it offers some advantages over other processes in effecting the exhaustion by liquid menstrua of many vegetable substances used in medicine, yet at no time nor in any country has it more than partially superseded the older, more familiar, and more simple process of maceration, and especially in the preparation of tinctures.

In conducting the process of percolation, the solid substances operated upon are required to be in a uniform and rather minute state of division, so that they may admit of being so packed in the percolator that the spaces between the separate pieces or masses of solid matter shall not be very sensibly greater than the natural spaces existing in the tissues of which the substances are composed. The more finely divided the solid substance is, provided that when packed in the percolator it will admit of percolation, the more perfect will the process be; but some vegetable substances, when in a finely divided state, and in contact with the menstruum, become compacted into so dense a mass that the liquid will not pass, and therefore the process does not admit of application in such cases, under the most favourable circumstances and with the best results. The reduction of the solid substances to the most suitable state of division, and the packing of these with the proper amount and kind of pressure, involve the exercise of much judgment and skill. A

filter-bed is to be formed of uniform structure throughout, capable of absorbing and holding the liquid menstruum by capillary attraction, and permitting of slow but uninterrupted percolation equally through every part of the mass, under the influence of hydrostatic pressure.

Although in all cases it is desirable and important, if possible, that the solid substances should be finely and equally divided, yet a deviation from these conditions is practically necessary in many instances, and the extent to which such deviation is required varies not only according to the nature of the substances under operation, but also according to the form of the percolator, and the quantity of material operated upon at once. It is therefore impossible to lay down any fixed rules, or to give such verbal instructions as would enable an inexperienced operator to perform the process with uniform success.

All we can say with reference to the required disintegration of the solid ingredients is that they should be as finely divided as is compatible with uninterrupted percolation under the conditions of the process in other respects. The degree of comminution may vary according to the nature of the liquid menstruum, and according to the quantity put into the percolator. Thus spirit will often percolate through a substance in fine powder, while water will not, and percolation may take place through a short column of solid materials, although it would be stopped by a longer column of the same materials in the same state. So the form of the percolator has something to do with the conditions that are required in other respects. There are two effects in the process, the results of which are especially influenced by the form and size of the percolator. These are, first, the swelling of the ingredients under the influence of the liquid, and secondly, the reduction in volume of the solid ingredients as they become exhausted by the solvent action of the liquid menstruum. If a long and perfectly cylindrical percolator be used, and the solid ingredients, after being introduced in the dry state, should swell on the addition of the liquid, they may become so closely compacted as to prevent percolation; whereas, in a percolator of a conical form, the expanding mass rises in the cone without undergoing the same amount of compression. Then again, where the solid substances have been packed in the percolator so that they shall be sufficiently tight, but not too tight, at the commencement of the process, if the ingredients yield much of their substance to the solvent, as, for instance, in the case of opium, the mass will necessarily contract in volume, and the result of this, in a cylindrical percolator, will be that it will leave the sides like a loose cork in the mouth of a bottle, and the liquid will pass there instead of percolating through the mass; whereas, in a percolator of a conical form, the contracting mass, under the circumstances indicated, will settle down in the cone, and still remain sufficiently tight to prevent the free passage of liquid at the sides. These circumstances have led to the adoption in most instances of a more or less conical form in the percolator, and the preference for this form has also been confirmed by the observation that as the liquid passes downwards it aggregates towards the middle of the column, so that near the bottom more liquid runs there than at the sides. These facts, however, have not sufficed to convince all operators of the superiority of conical over cylindrical percolators, and many still continue to use the latter. The first objection I have referred to is sometimes met by wetting the solid ingredients and allowing them to swell before putting them into the percolator; but this again is not free from objection, for it is more difficult to pack a wet powder than a dry one without leaving vacant spaces in the mass, which the liquid may afterwards form into channels, through which it will run in preference to its percolating through the denser parts. Moreover, it is found that vegetable powders do not generally swell when wetted with spirit so much as they do when water is the menstruum used. Hence some of the most able modern

advocates of the process of percolation as applied to the preparation of tinctures have contended that the solid ingredients should always be packed in the percolator in the dry state. This is much insisted upon by M. Buignet, in his paper, the most important perhaps that has appeared of late years on the subject, which was published in the 'Journal de Pharmacie' in 1857. M. Buignet states that he has succeeded in treating all the vegetable powders by percolation, using in all cases the fine powders, such as are ordinarily employed in medicine, without any admixture of sand or other similar substance; and he has accomplished this by having the powders carefully dried before putting them into the percolator, but he admits that the percolation has been so slow in some instances, that the process has occupied three or four days. At the same time he neglects to tell us how much he has operated upon at a time.

In the last edition (1863) of the United States Pharmacopœia, the process of percolation has been very generally adopted for the preparation of tinctures, and there the powders are directed to be moistened before being packed in the percolator. A conical percolator is directed to be used, and the percolation is to be carried on without allowing any time for the ingredients to macerate. This agrees also with the instructions given by others, including Buignet. It is a very general practice, however, to allow some time to elapse after adding the first portion of spirit to the solid ingredients, before commencing the percolation, the time thus allowed varying from two to twelve hours. This is, no doubt, necessary when the solid substances are not in fine powder, but in all such cases the process ceases to be perfectly efficient percolation, and it is rendered efficient only by superadding maceration.

In the percolation of the liquid through the bed of solid ingredients, it is intended to cause a great number of successive particles of liquid to come into contact with each separate particle or molecule of solid matter, until all that is soluble of the solid matter has been imparted to the liquid. A comparatively small quantity of liquid may in this way be made to exhaust the solid ingredients, if the mutual action of the two bodies be made as complete as possible. Not only must each solid particle have a great number of liquid particles brought into contact with it, and rubbed against it, but each liquid particle must be made to rub against a great number of solid particles, one after another, and this may be done until the liquid particles become saturated, and the solid particles are completely exhausted. But to effect this object it is not sufficient that the liquid should pass over the surface of masses of solid matter, it must permeate the masses, and come into contact with the proximate molecules themselves; and not only must the liquid permeate the masses, which it may be made to do by capillary attraction, there must also to some extent be a circulation through the masses, caused by hydrostatic pressure, and this can only be ensured by the masses being reduced to the smallest practicable size, and by their being packed so closely and tightly that the spaces between the masses are not very sensibly greater than those within the masses.

The differences of structure in the different vegetable substances operated upon, render it practically impossible to have the ingredients so packed that the required conditions shall be always equally fulfilled, and probably in few, if any instances, is it possible by the exercise of the greatest skill to fulfil the conditions perfectly. Thus, for instance, such substances as galls, ergot, dried opium, colchicum seeds, etc., are less porous than the cellular and vascular tissues of many woods, barks, and leaves, and if these two classes of substances be operated upon under similar circumstances with regard to disintegration, closeness of packing, and contact of the liquid, the exhaustion effected by mere percolation would necessarily differ to some extent, and the results could only be equalized by either extending the period of contact with

the liquid so as to make it partly a process of maceration, or by greatly increasing the quantity of liquid used. The difference in the results, however, would be less appreciable in proportion as the disintegration of the substances was more complete. In operating upon dense and horny substances, such as ergot and galls, if they are only coarsely bruised, the liquid will pass between and not through the masses, and the masses being of sensible and unequal size, the exhaustion will necessarily be very imperfect. In such case, the action of the liquid being principally confined to the surfaces of the masses, the more these are extended by disintegration of the substance, the more complete will the solvent action be, and in this way only can efficient exhaustion in a limited time be effected.

If the substance operated upon be of a more porous nature, such as capsicum, it may be more completely exhausted in the same time, although the disintegration be less perfect than in the other cases. The liquid here may be made to pass through the masses of the coarsely powdered capsicum, and the percolating process, unaided by maceration, may effect the required object. Still, even in this case, more liquid will pass between the masses than through them, consequently the surfaces of the masses will be exhausted before the interior parts; and if it be required to effect the exhaustion with the smallest possible quantity of liquid, the masses must be reduced to the smallest practicable size, so as to extend the surface action, and by equalizing the packing to render the percolation more complete and efficient.

It will thus be seen that for carrying out the process of percolation in the preparation of tinctures modifications in the mode of operating have to be made in different cases, and these admit of, and even require, many variations, the exact nature of which it is difficult to indicate without a knowledge of all the circumstances under which the operation is conducted, and some of which it is impossible to describe verbally. The process is therefore one the skilful performance of which is acquired only by experience, and it involves more than a little experience, knowledge, and judgment. We may thus account for the fact, that among those who practise the process, there are hardly any two who operate in exactly the same way, and every one is wedded to his own mode of operating, and to the form of apparatus that he has been accustomed to use.

There can be no doubt as to the efficacy of percolation, when well conducted, in effecting the exhaustion of solid substances, such as are used in making tinctures, and of its superiority over the old process of maceration when highly concentrated solutions are required. It is applied, and is only applicable, for the treatment of solid matter a part only of which is soluble in the menstruum used. It would be useless to apply it to matter that is wholly soluble; it is useful only where much of the solid matter is insoluble and forms a permanent filter-bed. It is an operation in which all that is soluble in the solid matter operated upon may, by skilful and judicious management, be dissolved or extracted with the minimum quantity of solvent.

It may be asked, to what extent and how does percolation differ in result from the action of maceration, where similar quantities of liquid and solid substances are used? It will be found, upon examination, that the difference is material. In maceration, the solid substance being added at once to the whole of the liquid menstruum, every solid mass is surrounded by a separate portion of liquid, part of which is absorbed from every side by capillary attraction, and the liquid which thus penetrates the masses remains there sensibly quiescent, the same liquid particles continuing in contact with the same solid particles, and no change occurring excepting the very slow and imperfect change caused by liquid diffusion, and that effected by the occasional mechanical agitation of the ingredients. In percolation, on the other

hand, there is a constant change of particles, caused by the manner in which the liquid is made to pass through the solid mass, from particle to particle, and from mass to mass, so that the action is here much more complete and efficient than it is in the other case.

But the process is not merely one of percolation, it is also a process of displacement, and much of its value depends upon the means it affords, after the soluble matter has been dissolved or extracted by percolation, of separating this from the solid mass. It may sometimes happen that all that is required to be separated from the solid substance can be dissolved by the quantity of liquid absorbed and retained by capillary attraction in the pores of the mass. In such a case, in operating by the process of maceration, we can only get at the prôduct by expression, and as this effects the separation of only a part, the remainder of the concentrated and it may be valuable solution is lost; but in the process of percolation the product is separated by displacement, and by this means we obtain the whole or nearly the whole of it. The displacement is effected by continuing the percolation with fresh portions of the liquid after the quantity required for solution has been used. It rarely occurs, however, in cases such as I am contemplating, that complete exhaustion of everything soluble is effected within the limits of a practical operation. We do not find that the liquid first used dissolves all that is soluble, and that a further addition of the same liquid displaces the first solution without becoming itself charged with any soluble matter. The first may contain the principal part of the soluble matter, and that which follows may have comparatively little, but there will be no well-defined line of demarcation between the solution and the liquid used for its displacement, the one will gradually merge by successive shading into the other, and there will not generally be an entire absence of soluble matter from the percolating liquid even to the last. In operations in which water, either cold or hot, is used as the solvent, and in which the product is afterwards concentrated by evaporation, the percolation may be continued until nothing more is extracted worth separating, and the liquor then remaining in the marc will be left as worthless. If spirit be used as the solvent, and the solution is not required to be produced in a concentrated state and of definite strength, the percolation can be carried on, as in the previous case, until nothing more worth getting is extracted, and spirit alone will then be left in the marc; but in the preparation of tinctures the case is different, and here it is necessary to use a definite quantity of the solvent, and to limit the product without reference to the complete or incomplete exhaustion of the substances operated upon. It is with reference to its application for the preparation of tinctures that I am now considering this process, and the most important object, next, or indeed equal, to that of getting a perfectly efficient preparation, is the production of definite results that shall not be liable to variation when obtained at different times and by different operators.

It is not easy, even in this process, to avoid slight variations in the details which may affect the results. Thus, if there should be differences in the state of comminution of the solid substances, this would be a possible source of variation in the product; but even if the solid ingredients were always reduced to the same state of comminution, there may still be differences in the results, arising from the different amounts of pressure applied in packing or produced by the weight of the ingredients themselves according to the quantity contained in the percolator.

But there is a source of variation in the products, as frequently obtained, of a far more serious character, arising from the use of water for displacing the tincture first formed with spirit. There is a strong inducement for the use of water as a displacing liquid to save the employment of spirit, for if the dis-

placement of the tincture be effected with spirit, this will be left in the marc, and can only be recovered either by subsequent displacement with water, or partially by expression. In either case, the spirit so recovered will be more or less impure, and will not readily admit of purification, or of any useful application in its unpurified state. It is to avoid this loss or inconvenience that many operators, after percolating with the quantity of spirit required for the production of the tincture, instead of displacing what is left in the percolator with a further portion of spirit, substitute water at once as the displacing liquid; but the almost inevitable effect of this practice is to cause the introduction of variable quantities of water into the tinctures, and in other respects to alter and deteriorate the products.

It is easy to show by experiment that water placed over spirit falls through the latter, and in doing so rapidly mixes with it. Thus, if two glass bulbs, connected by a slender tube, be filled, one with pure water and the other with coloured spirit, and placed so that the spirit is above the water, they will remain unmixed for a great length of time; but if the apparatus be reversed, so that the water is placed above the spirit, complete admixture takes place in a few minutes.

Now, in attempting to displace a spirituous tincture with water, a column of the latter is placed over the tincture, and although the very rapid admixture of the two is counteracted by the minuteness of the channels through which they have to flow, yet admixture does take place, the spirit passing upwards while the water passes down; and the extent to which this occurs will depend upon the length of time during which this part of the process is in operation, and the condition of the ingredients through which the liquids have to pass.

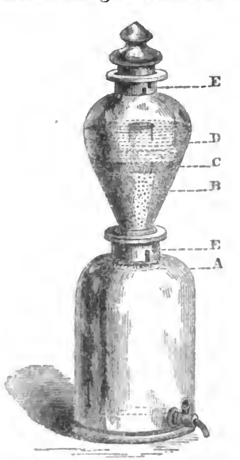
It is now admitted by the most able advocates of the process, that one and the same liquid should be used for percolation and displacement, until the whole of the product intended for use as tincture has been collected, and that water can only be used safely and properly for recovering the impure spirit left in the percolator after the production and separation of the tincture has been completed. In accordance with this view, it will be found that in the preparation of those tinctures for which percolation is ordered in the United States Pharmacopœia, the spirituous menstruum is directed to be used throughout the process, and no reference is made to the recovery of the spirit left in the apparatus when the operation is completed. Buignet, to whom I have already alluded, also takes the same view, and directs the spirit to be used from first to last. In countries where spirit is cheap, the loss that is thus entailed may be of little importance, but such is not the case in this country; and if displacement of the tincture with water be not considered admissible, as it certainly cannot be, this will materially modify the opinion that many have formed with reference to the economy of the process of percolation.

No better case could be taken for illustrating the process throughout, for showing how a vegetable powder may be exhausted with the minimum quantity of liquid, and the extent to which the solution so formed may be separated from the solid mass by displacement, than is afforded in the preparation of—

Essence of Ginger. This may be very readily economically and successfully produced by treating finely-powdered ginger with rectified spirit in a percolator. The ginger cannot be too finely powdered, yet it does not require admixture with sand or any other substance. It may be tightly compressed in the percolator, and yet it will not unduly impede the percolation. It easily yields its soluble matter to spirit, and may be exhausted with about its own weight of this liquid; yet, in its exhaustion by spirit, there is not such a diminution effected in the volume of the powder, and consequent contraction of the solid mass, as to interfere with the efficiency of the percolation. The conditions are thus in every respect favourable to the success of the operation.

In describing this process, I shall refer to the use of the very convenient glass percolator made by the York Glass Company.

A piece of straining-cloth having been tied over the lower end of the conical vessel at (A), a layer of white sand, about half an inch thick, is put on the strainer to form a filter-bed, and over this is laid the powdered ginger, which, as it is introduced, should be well rammed down with a wooden rod, or other suitable instrument. Having thus introduced the ginger (B) to the extent of, say a pound, and carefully packed it, so that it shall be equally compressed in all parts, and free from any loose or vacant spaces, a layer of sand (C) may be put over the surface of the ginger to prevent it from being disturbed when the spirit is introduced. A cork shive is now introduced, to facilitate the pouring in of the spirit without disturbing the filter-bed. The spirit is poured by means of a guide-rod on to the cork, and spreading over the powder forms a column (D) above it, the cork floating and dispersing the stream as the spirit rises. A pint of rectified spirit may be used for this purpose, and this, when introduced, should be gradually and equally absorbed by the ginger, passing downwards and forming a visible line, which affords a good indication of how far the packing of the ginger has been dexterously performed. If the powder has been well packed and equally compressed, the line as it descends will form an even and horizontal ring round the vessel; if, on the other hand, one part of the powder is less compressed than another, the spirit will pass there more quickly than elsewhere, and the line will be uneven or not horizontal. The spirit in thus percolating may occupy about five minutes in passing through a column of an inch in depth. When it has passed to the bottom, and the whole of the powder has absorbed as much spirit as it is capable of holding, the percolation may be either suspended or proceeded with at once. In this instance the latter course may be adopted, but it is sometimes considered desirable to suspend the percolation for a short time, or to slacken the flow of the liquid, and the apparatus admits of adjustment so as to accomplish these objects by a very ingenious, simple, and economical contrivance, which constitutes the peculiar feature in this percolator. The lower end of the conical vessel in which the percolation is effected is ground very accurately into the mouth of the receiver, and the glass stopper is in like manner ground accurately into the mouth of the conical vessel. It is obvious that these being fixed in their places and fitting air-tight, the passage of the liquid from the upper to the lower vessel would be prevented by the pressure of the air below, and the resistance to exhaustion exerted above the liquid; but this impediment would at once be removed if air could escape from the lower vessel, and could at the same time enter the upper vessel as the percolation proceeds. Now provision is made for allowing or stopping the passage of air by two grooves cut in the glass, as shown at E E. One of these grooves is cut in the mouth of the vessel, and the other in the stopper that fits into it. Neither of the grooves extends more than halfway through the stoppered part, the one passing through the upper, and the other through the



York Glass Company's Percolator.

lower half; and therefore, unless they be brought in a line, they will not communicate, and there will be no passage for air. By turning the stopper the grooves may be connected or separated, and this may be done wholly or partially, so that the passage of air may be allowed to take place freely or slowly, or not at all, by adjusting the relative positions of these grooves, and the flow of the liquid is thus brought completely under control.

Continuing the percolation of the ginger, or rather the displacement of the tincture already formed by the spirit that has been absorbed: if a pint of spirit has been used in the first part of the operation, the same quantity ought to suffice for its displacement, and this quantity of spirit being carefully introduced as before, the process may proceed until a pint of strong tincture has been recovered. This displacement of the tincture by the superincumbent spirit will take place without the occurrence of more than a slight admixture of the two liquids. The progress of this operation will be indicated by a line showing where the two liquids join, the liquid above this line being nearly pure spirit while that below it is a dark-coloured tincture. When this line has reached the bottom of the percolator, the tincture first formed will have been displaced as completely as the process will admit of its being done without dilution. It will be found, however, that the ginger has not been completely exhausted by the passage of the first pint of tincture, for the spirit that passes afterwards will contain a little of the active matter of the ginger; and this, I believe, arises, not from the inadequacy of the first portion of spirit for the exhaustion of the ginger, but from the incompleteness of the displacement. In fact, the displacing spirit passes more readily between the masses of ginger, minute as they are, than it does through them, and these masses do not therefore give up their liquid contents immediately under the influence of the displacing spirit, but gradually empty themselves into it. It will be observed on close examination during the process, that the line of demarcation between the two columns of liquid becomes less defined and distinct as it approaches the bottom of the mass, a shading into the upper column being perceptible, which is occasioned by the diffusion of the contents of the little masses of ginger into the displacing liquid. In order to recover the whole of the soluble matter, therefore, it will be necessary to displace at least a part of the second portion of spirit, but the tincture thus procured will be much weaker than the preceding.

In operating in this way, *nearly* the whole of the active and soluble constituents of the ginger are obtained in solution in the first portion of tincture displaced, and by continuing the process until a quantity of tincture, rather less than double the weight of the ginger, has passed, the solid residue will be so completely exhausted as not to retain the slightest taste or smell.

There are but few substances employed in the preparation of tinctures that admit of the application of the displacement process so readily and advantageously as ginger does; and therefore, in studying the process and its results in this case, we at least see the full extent of the advantages it may possess. These may be briefly stated as follows:—

1. Economy of time. This is one of the most important advantages in this process, as a tincture may be prepared in a few hours, which by maceration would require a week or two.

2. Excellence of product. Some tinctures are considered to be better when made by this process than by lengthened maceration, because in the latter case a change may be effected in some of the soluble constituents of the solution first formed when this is left in contact with the insoluble residue of the vegetable substance.

3. Concentrated state of the product. The process is certainly well suited for getting highly-concentrated tinctures.

4. Recovery of the valuable part of the product. This is more completely effected by this process than it can be by maceration and expression.

On the other hand, there are some objections that may be urged against the process of percolation, and especially against its general application for the preparation of tinctures.

1. It requires skill and knowledge for its successful application, which can only be acquired by much experience; whereas in making tinctures by maceration, unskilled labour, such as that of apprentices, can be applied.

2. Although the time involved in making a tincture by percolation is comparatively short, yet during the whole of this time the attention of the operator is required, whereas in operating by maceration such is not the case.

3. Although a larger proportion of the strong tincture is recovered by percolation and displacement than by maceration and expression, yet in the former case, when legitimately conducted, the last part of the tincture is only recovered at the cost of an equal volume of spirit which is used for displacement.

4. There is a strong temptation for the use of water as a displacing liquid, and great danger in using it of diluting and otherwise injuring the tincture.

The process of maceration, which is the oldest and most familiar mode of operating, although it presents the advantage of great simplicity, being a process that any one can perform, is nevertheless by no means a perfect process. As a means of effecting the exhaustion of the substances operated upon it is inefficient, unless the ingredients be frequently agitated, and this necessary part of the operation is often neglected or irregularly attended to. Then the period required for maceration is inconveniently long, and as it is difficult, with the large number of tinctures to be made, to keep a correct register of the times at which the process should terminate, much irregularity often attends this as well as other parts of the process.

Dr. Burton's modification of the process of maceration was suggested in 1844,* with the view of obviating the necessity for agitation while the ingredients are macerating, and it consists in suspending the solid ingredients, enclosed in a bag, near the top of the liquid in which they are macerated, instead of allowing them to remain at the bottom. The same principle had previously been applied and has frequently been advocated for the preparation of infusions, and its suggested application for the preparation of tinctures would probably have been more extensively tried if a suitable apparatus for the purpose had been devised. Some years ago Mr. Samuel Gale, who was then my laboratory assistant, induced Mr. Green, of Lambeth, to make some stone jars with perforated diaphragms that could be fixed at any required distance from the bottom, with a view to their application for carrying out this process; but the arrangement of the jar did not fully realize the intended object, as the solid ingredients placed on such a diaphragm, and forming a solid bed across the column of liquid in the jar, was found to obstruct the circulation contemplated by Dr. Burton.

In the new process of the British Pharmacopœia we have another modification of the process of maceration. In this we are directed to macerate the ingredients, with occasional agitation, for forty-eight hours with three-fourths of the spirit, then to turn the ingredients into a percolator, and when the liquid has ceased to pass, to add the rémaining fourth of the spirit, and allow this to percolate through; then to subject the contents of the percolator to pressure, and finally to make up the whole to a stated quantity by further addition of spirit. The object here seems to have been to remove the principal objection that attaches to maceration by reducing the time occupied in the

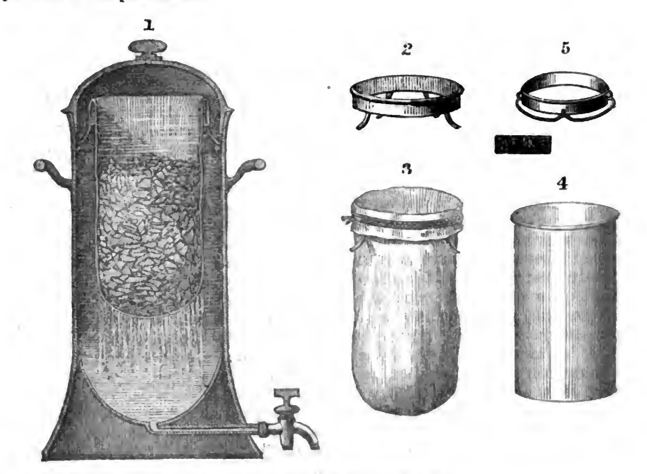
* 'Pharmaceutical Journal,' vol. iv. p. 469.

process to two days, to render this period of maceration efficient by supplementing it with a process of percolation or displacement, and to make the whole operation simple and easy of accomplishment by omitting those parts of the process of percolation which involve difficulty and require skill.

I have been favourably impressed with the general characters of this process from the first, and think we have here the basis of a process admirably well adapted for general adoption, involving no difficulties of manipulation, and capable of yielding uniform and satisfactory results without unduly taxing the attention or the skill of the operator.

I think, however, that the process as described in the Pharmacopœia is not so complete, simple, and efficient as it is capable of being made, and among the objects I have had in view in this communication have been those of suggesting a modification in the Pharmacopœia process, and of describing a suitable form of apparatus for its application.

THE AUTOMATIC DISPLACEMENT PROCESS is the name I propose to give to this mode of operating, which, while it practically fulfils the requirements of the Pharmacopœia, comprises the principles of Dr. Burton's process and of the process of displacement.



Automatic Displacement Apparatus.

Commencing with the maceration of the solid ingredients in three-fourths of the spirit, I propose to effect this by suspending them in the upper part of the liquid, and thus to avoid the necessity for agitation. The apparatus I have had made for the purpose is a copper vessel, well tinned inside, with a round bottom and well-fitting cover. It is furnished with a cock, so fixed that the whole of the liquid contents can be drawn off. Near the top of the vessel a wire is fixed against the inner surface for the support of the ring (2), to which the bag is to be attached, as shown at (3). The bag may be made of flannel, or other suitable material. It should be cylindrical, with a round

piece sewn in at the bottom, and sufficiently long to reach nearly to the bottom of the vessel. The open end of the bag, which is about equal in circumference to the ring (2), is to be passed up through the ring, and then turned over and secured with a piece of string. The capacity of the bag may be made to suit the substances to be put into it by turning more or less of it over at the top.

Having introduced the materials, including the spirit, as shown in the drawing (1), the automatic process speedily commences; the spirit in contact with the solid ingredients becoming charged with soluble matter, and heavier than the surrounding uncharged spirit, falls through the bag by its gravity, its place being taken by fresh portions of the lighter spirit. A constant circulation is thus kept up, and a percolating and displacing process is maintained for the whole forty-eight hours, during which the Pharmacopœia directs the maceration to be continued. At the end of this time the tincture is drawn off, and when the contents of the bag have been drained, the next part of the process is to be commenced. The cylinder (4), which is open at both ends, and loosely fits within the ring (2), so that it can be introduced when the bag is in its place, is pushed down between the bag and its contents, so as to prevent the escape of any liquid through the sides of the bag when placed over the solid mass. The remaining fourth of the spirit is now introduced, and this, percolating through, displaces the tincture held by capillary attraction in the solid ingredients, and the exhaustion of these ingredients is thus completed. When no more liquid passes, the cylinder may be withdrawn from the bag, and the bag removed from its place, separated from the metallic ring to which it is attached, squeezed with the hands so as to press out as much of the liquid as can be thus separated, and then put into the press-box of a small tincture-press for further expression. It will be found convenient to have a strong perforated cylindrical box, of tinned copper, into which the bag will fit, and which, being placed under the screw of an ordinary tincture-press, will admit of the application of this part of the process without removing the materials from the bag into which they were first put.

I have found an advantage in having the ring made as shown at (5), and supporting it on three projecting studs attached to the inner surface of the copper vessel. There may then be a second set of studs two or three inches lower down, on which the ring may be placed if it be desired to operate with a smaller quantity of spirit, or if a short bag be used which would not take the whole length of the cylinder, and would therefore leave part of it projecting upwards.*

The same arrangement may very readily be adapted to a wide-mouthed bottle or jar, by having the ring (3) supported on three wire legs, as shown in the following drawings.

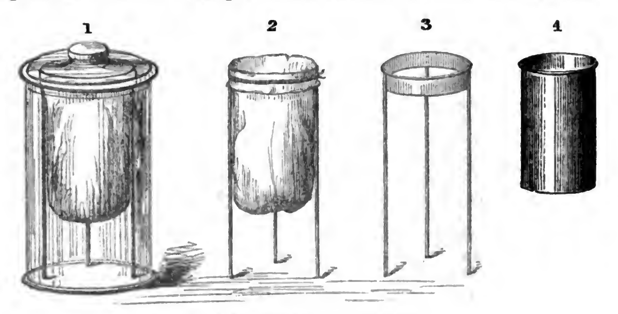
This method of preparing tinctures presents some important advantages.

It is easily performed, and occupies but little time in its performance. In these respects it occupies a position intermediate between those of percolation and maceration. Although it is not quite so simple a process as that of maceration, yet it requires less frequent attention, and is of much shorter duration.

Its automatic character renders it independent of the operator during the first part of the process, and the result is not affected therefore by the amount

* Mr. Coffey, the well-known Pharmaceutical Engineer, has contrived a plan for making the lid fit air-tight, by means of an india-rubber band, which entirely prevents evaporation; and he is prepared to supply the complete apparatus in three sizes, for one, two, and four gallons of tincture.

of attention it may receive, as it is in the ordinary process of maceration. Then, as no personal attention is required during the period of maceration, there is no temptation or excuse for any deviation from the prescribed instructions. All that is required is, that the ingredients should be bruised, or otherwise prepared as directed, and after being put into the apparatus, that they should be left there for the prescribed time. This time is not inconveniently long, nor is it difficult to keep a correct account of it in the preparation of



Automatic Displacement Apparatus.

several tinctures. There is a little card-frame attached to the front of the apparatus, into which a card is put, with the name of the tincture and the date at which the process was commenced. When the macerating time has expired the tincture is drawn off, and should be put into a bottle or other vessel that will form a measure of the quantity of tincture to be produced. In the draining of the liquid from the bag in this part of the process, the solid ingredients will pack themselves so as to be prepared for the next operation. The cylinder is now to be introduced; and in doing this, if the sides of the bag be slightly squeezed with the hands, there will be no difficulty in pushing the cylinder between the bag and its contents. The ingredients should then be pressed down with a rod, and the remaining fourth of the spirit poured over them. All the difficulties of the ordinary process of percolation are thus got rid of. If there be only a small quantity of solid ingredients, requiring a bag much shorter than the cylinder, the top of the latter will of course project above the ring, and as this would obstruct the fixing of the cover in its place while the ring rests on the upper studs, it will be necessary in such case to put the ring on to the lower studs. The percolation under these circumstances will take place without further attention; and when completed, the cylinder is to be removed, the bag separated from the ring, and with its contents submitted to expression. The pressed tincture, and that obtained by displacement in the previous part of the process, are to be added to the tincture first made by maceration, and the whole made up to the specified quantity by further addition of spirit.

Tinctures made in this way appear to be unexceptionable in every respect, and the process will recommend itself by its applicability to all tinctures, and to operations upon the large as well as the small scale, and also by the perfect facility with which it is performed.

Mr. Deane was very glad to have an opportunity of offering a few words on the subject of percolation. Much, however, that he had intended saying

had already been adverted to by Dr. Redwood, who had gone so fully into the subject, as to leave him little to say on the matter. His experience on this subject was somewhat large, having carefully practised it from the time he first brought it before the notice of the Society at one of its earliest meetings, held at the house of the late Jacob Bell. He commenced upon a plan recommended in the 'American Journal of Pharmacy' (vol. x. p. 1), and had not proceeded far before he found that there was much to learn before he could get at the secrets of the process. The condition and character of the dry materials, the amount of moisture to be employed, the packing in the cylinder, the rate of percolation, and the correct form of apparatus, had all to be studied. Perhaps the first difficulty was the packing in the cylinder; for if too tightly packed, the fluid would not pass through, and if too loosely, it would run too fast, involving the necessity for a large quantity of fluid to exhaust the substance. This led to the use of a tap to regulate the flow, and which was of great assistance. From its use was learned the fact that the slower the operation, the smaller the quantity of fluid required to exhaust the material.

This suggested what might be termed a fractional mode of displacement; that was, drawing off definite quantities at definite and regular intervals of time, and taking the specific gravity of each quantity drawn off. By this method the best rate of displacement was in time determined for each particular substance. Up to the present time, he had made between three thousand and four thousand weighings in a specific gravity bottle, and had learned much from it, especially this, that it is not a simple process of displacement or percolation, but both, combined with maceration; for instance, oil on the top of water in a cylinder will displace the water, but when a multitude of particles of matter are surrounded with a quantity of fluid denser than that which is intended to displace it, the superincumbent fluid does not so readily drive it forward as is apt to be imagined. Let this cylinder full of marbles represent the case. Every marble wetted with the denser fluid would, from the cohesive force exerted, allow the lighter fluid to pass without carrying all the soluble matter before it, and that in proportion to the velocity with which the liquid was run off; and if these particles represented by the marbles were particles of rhubarb, or any other cellular tissue, the cohesive force would be complicated with endosmotic and exosmotic action, involving the necessity for a considerable amount of maceration at the same time. Hence it was found that the interstitial fluid even could not be simply displaced, much less that which was intercellular, and the fluid passed away in a constantly decreasing ratio of density, as shown in the following illustration:—

Dry Material, 65 oz. troy weight. Wet with 106 fl. oz. of proof spirit, sp. gr. ·923, macerate three days, pack tightly in a percolator, when it was found that a very small quantity ($\frac{1}{2}$ oz.) would just drain from it. Percolate with proof spirit as above, to the extent of 16 pints = 320 fl. oz.

1st 3 oz.	had sp. gr. of		980
of 1st 40 oz.	”	976	
1st 3 oz.	”		971·2
of 2nd 40 oz.	”	969·6	
1st 3 oz.	”		962
of 3rd 40 oz.	”	957·6	
1st 3 oz.	”		950
of 4th 40 oz.	”	946	
1st 3 oz.	”		940
of 5th 40 oz.	”	937·2	
1st 3 oz.	”		934·4
of 6th 40 oz.	”	932·8	
1st 3 oz.	”		929·6
of 7th 40 oz.	”	930	

1st 3 oz. had sp. gr. of		927·2
of 8th 40 oz. „	926·8	
Finished Tincture . . . . mean	947	
Pressings of residue, 70 fl. oz. . . .		926

The state of disintegration of the ingredients to be operated upon, and the quantity of moisture to be employed in the first wetting of them, were matters for grave consideration; they had to be modified according to circumstances. Theoretically, the finer the state of division the better; but practically, this will not answer. In small quantities some substances may be finely divided, but on a large scale it would be impracticable,—in the first place, from the impossibility of working a large quantity of fine powder, and secondly, the expense of time and labour required would be a complete bar to its adoption. A sieve twenty wires to the inch is fine enough for most things, and some substances to be operated upon with water only may be very much coarser. The quantity of fluid to be employed must vary according to the nature of the ingredients whether they are of a hard or soft texture, and whether spirit or water, or a mixture of both, is to be the medium. One great impediment to successful operation is the presence of multitudes of air-bubbles dispersed through the matter operated upon, giving rise to channels through which the fluid will pass rather than uniformly through the whole mass. These arise from various causes, which experience only will teach; but there is one source of difficulty on this point which appears to have been entirely overlooked by most operators, or at least not referred to in print, namely, the intercellular air-spaces of many vegetable substances. It is a great mistake with such substances to at once wet them with a quantity of fluid, which would convert them into a kind of pudding or mud, especially if they contain much mucilaginous matter. The exhausting of such a substance with a moderate amount of fluid, especially if it be water, is almost impracticable, in consequence of the water surrounding the air-spaces and rendering the escape of the confined air almost an impossibility; but the method recommended in the Edinburgh Pharmacopœia is founded on sound philosophical principles, and obviates the difficulty, so that even rhubarb, a most troublesome substance, can be managed by it. It recommends the substance to be wetted *with half its weight* of the liquid. Why should this small quantity, which leaves the substance in a merely damp mealy condition, be better than the larger quantity, which appears to wet it so much more completely? He apprehended it was this,—that the smaller quantity being sufficient to damp the substance and cause the cells filled with dry matter to swell out, by so doing caused the expulsion of the air from the empty cells and intercellular spaces, and thus removed one great obstacle to the satisfactory extraction of the soluble matter. But, as before observed, it is not every substance that can be so treated; others require a much larger quantity of fluid to begin with, and it is singular that too much or too little fluid used in the first wetting will lead to an equally unsatisfactory result in the non-exhaustion of the substance with a reasonable amount of fluid. As a general rule, he had found that substances were not exhausted with less than four times their weight of fluid; there were exceptions—some might be exhausted with less than four, and some required five or six times their weight, but much depended upon the state of disintegration and the skill of the operator; hence the extraction of a small quantity of tincture from a large quantity of dry substance was a very difficult operation even in the hands of the most experienced, and for this reason he regretted to see such conditions required in the new Pharmacopœia. When a large quantity was to be obtained from a small quantity of matter, the case was very different; but even then, on

a large scale he believed it was impracticable. The operation must be carried on by means of skilled labour, a common labourer could not do it; it required constant thought and attention. He had had nearly twenty-seven years' experience, and of all the assistants and apprentices he had had during that time, most of whom had endeavoured to comprehend the subject, only one, a Mauritius man, had really taken in the philosophy of the subject. It was not always convenient or practicable to adopt automatic means for the prevention of irregularity, nor could the operator always keep his eyes continually on the process. As a rule, therefore, it could not be placed in the hands of every one, and therefore could never be a process to be used by the majority of those for whom it was designed.

The form of the apparatus was one of great importance. At first, and for a considerable time, he had employed a cylinder with a flat or slightly concave bottom, with an exit tube fixed in the centre, but finding that invariably there was a portion of the substance imperfectly acted upon in the angles at the bottom of the cylinder, he tried cylinders with funnel-shaped bottoms; but in retaining the cylindrical form at all, there was the repeated inconvenience of some substances shrinking from the sides to an inconvenient extent when by any chance they were allowed to run dry before the operation was complete. Having these difficulties before him, and referring back to the dead space observed in the cylinders with flat bottoms, he repeated some operations in them, turned out the mark, and cut it vertically down the centre. The direction which the great bulk of the fluid employed had taken was so marked and uniform in each case, that he had been led to the adoption of an apparatus that answered perfectly, and which was a portion of an elongated cone whose sides formed an angle of 82° to the base line. The dimensions of one of such vessels he had in constant use, and which would be found generally useful, was twelve inches deep, nine inches broad at top, and six inches at bottom; the bottom rather concave, with a tubular opening for arranging a tap. The apex of the cone was not good for ordinary purposes; for, in the first place, to hold a sufficiency of matter to be operated upon, it must be made of an inconvenient length, and secondly, it was liable to clog. It was somewhat singular that if the angle were too small, as in a common funnel, the fluid seemed to him to have a tendency, in some instances, to find its way down the sides of the funnel rather than through the body of the material. Those who were interested in carrying out this valuable and nice operation in a scientific manner would do well to study it in the fractional manner above described, for he was satisfied there was much valuable information yet to be learned from it. He quite agreed with Dr. Redwood that you cannot displace spirit with water, and with whatever liquid you commence your operation, with that you must complete it. When small quantities of dry matter are used, the quantity of spirit retained may not be worth saving, but larger quantities should be pressed, and the pressings set aside and properly labelled, to be employed in the commencement of the next operation on the same substance. This was one of the inconveniences of the process, involving the use of many bottles and much space, which few could afford.

Mr. Hills said that at that late hour he would detain the meeting only a minute or two, to say that both Dr. Redwood and Mr. Deane in their interesting account of the process of percolation and displacement, admitted that it required the greatest nicety of manipulation, and that by an expert, to carry it out in a satisfactory manner. He (Mr. Hills) was convinced that maceration with agitation was the best way of making tinctures. He had made a tincture at the same time Dr. Redwood was making one by his automatic process, and although he had only six-and-forty hours to make it, in order to compare with Dr. Redwood's, it was found to be quite equal to the latter.

Mr. Hills admitted that percolation had its advantages in some cases, but taking tinctures generally, he was convinced that maceration for six days with good agitation was more easily accomplished, and yielded a more satisfactory product.

PHARMACEUTICAL SOCIETY, EDINBURGH.

The Fifth and last Scientific Meeting for the present Session was held in St. George's Hall, on Monday evening, 18th April, at 9 o'clock; Mr. G. Blanshard, President, in the chair.

Professor Archer, Director of the Industrial Museum, on being introduced by the Chairman, read the following Notes on some of the new Materia Medica products, exhibited in the International Exhibition of 1862.

Having collected in the Exhibition of 1862 many hundreds of specimens of Materia Medica, I propose from time to time to bring under the notice of this Society such of them as I think may prove interesting, either from their novelty, utility, or any other prominent quality. For this evening I have selected two small groups which have no connection with each other, but were most convenient to myself, and I believe both possess considerable interest.

The first I present to your notice is a series of Extracts, prepared by M. Berjot, *jeune pharmacien* of Caen, one of the most extensive manufacturers in France. A single glance at these beautiful preparations will show the great difference between them and the pharmacopœial preparations of this country. These extracts are prepared from decoctions, made *in vacuo*, which have been passed through percolators, similar to that which I have before me, but how he secures the extremely light and frothy character I am unable to explain, or whether it has any real advantages; my own opinion is that it must have, because if kept perfectly dry we are sure of greater uniformity of strength than when an indefinite quantity of moisture is present. One difficulty certainly attends them, and that is their remarkable hygroscopic quality, which causes them so rapidly to absorb moisture from the atmosphere, that if exposed, even for a few seconds, a noisy crepitation is heard, almost like the crackling of a piece of very dry wood in burning.

M. Berjot overcomes this difficulty in an ingenious way. In the wide mouths of his bottles, which have screw tops, he places a small chamber filled with unslacked lime, which from its still greater power to absorb moisture arrests all that can pass in through the well-closed screw stopper. The extracts are those of the grey, yellow, red, and orange Cinchona barks, and of Krameria root. M. Berjot's annual production of these light extracts is no less than 4400 lb. Besides these, I have from the same manufacturer a most interesting series of certain prepared flowers and leaves, used in French pharmacy; these are so beautifully prepared, and are such examples of that care which is the crowning merit of pharmaceutical manufacturers, that I am sure they will command the admiration of the Society. They consist of the flowers of *Viola odorata*, *Vinca major*, *Centaurea cyanea*, *Althæa officinalis*, *Lamium album*, *Papaver Rhœas*, *Malva rotundifolia*, and *Spartium junceum*, and of the leaves of *Conium maculatum*. All of these have the appearance of having within the present hour been plucked from the producing plants with the greatest care; the colours of all are as bright as when growing. The forms of the flowers are perfect, not a petal is crushed, the odour is scarcely impaired, and the leaves of the hemlock are as green as when growing. I have no doubt that the method pursued in preparing these parts of plants so perfect, has been by burying them in hot sand very fine and dry, and in order to prevent any change from damp, M. Berjot has applied his most ingenious lime-chambers also to these. The specimens before the Society are at least three years old, for they were in London all of 1862, and since then have been in our Industrial Museum, to which they were generously presented by M. Berjot; yet during the time they have been under my care, although anxiously watched, they have not shown the slightest change. If these preparations have to us no other value than as examples of what may be done by ingenuity and nice manipulation, they will be of the utmost use to those who thoughtfully examine them.

Our colonies furnished many curious contributions to Materia Medica, and I have selected one of the smallest of our colonial groups for this evening, viz. that of the Island of Trinidad.

The first is a drug, called on the island Mapourito; it is the root of *Petiveria alliacea*, L.,

a plant belonging to the Natural Order *Phytolaccaceæ*, which, as a rule, is not remarkable for any active properties. This, however, has a strong and somewhat alliaceous odour; it is a hard woody root, very fibrous, the main part not being much thicker than the little finger. It is said to be both diuretic and diaphoretic, and to be useful in febrile cases. It is also pungent enough to be recommended for the toothache.

A very similar root in appearance is that called native Ipecacuanha, produced by *Asclepias curassavica*, L., (Nat. Ord. *Asclepiadaceæ*). It is a most abundant and disagreeable weed in the island, where it is known by the French colonists as Petit Brenda Ipeca, or Brenda Savane; and by the Spaniards as Borachera, or Platanillo. It is a very powerful emetic, requiring much care in its administration, and is rarely used when the true Ipecacuanha can be obtained. It would be interesting to ascertain the nature of the active principle in this root, and whether, if isolated, it would be a more manageable remedy.

Lignum-Vitæ bark (*Guaiacum officinale*, L., Nat. Ord. *Zygophyllaceæ*) forms an important feature in Trinidad pharmacy. We are in the habit of employing the wood and the gum-resin; but such is not the case in Trinidad, where the bark, as is most probable, is held to be the most active. It is an agreeable bitter, and is used as a tonic medicine, and forms one of the ingredients in a diet drink called *Mabie*, which is a common beverage.

An excellent specimen of the root of *Dorstenia brasiliensis* (Nat. Ord. *Moraceæ*) is also in the collection; it has no great value, but is regarded by the Spaniards as an admirable antidote to the bites of snakes.

Cainca root, *Chiococca racemosa*, Jacquin (Nat. Ord. *Rubiaceæ*), the Grand Brenda of the French settlers, formerly had a great reputation in Europe as a mild diuretic, but its tendency to spoil by keeping has caused it to be disregarded. It is, however, much valued by the Trinidad practitioners in cases of dropsy, where more drastic remedies would be injurious. When in good condition it has a strong smell of Castoreum, which probably led to its use in Europe, where at one time it sold as high as four shillings an ounce.

A much more powerful diuretic is the bark of *Schnella excisa*, Grisebach (*Leguminosæ*), the Liane Tasso of the French and the Bejuco de Cadena of the Spanish settlers. Besides its properties as a diuretic, it is also astringent.

A very remarkable aromatic and stimulant bitter is prepared from the seeds of *Xylopia grandiflora*, Kunth (Nat. Ord. *Anonaceæ*), which is not only esteemed in Trinidad, but is also in great favour amongst the Indians of the mainland, in the districts of Atures and Maypura, on the Orinoco, where, as in Trinidad, it is known as Frutta de Burro. It has the remarkable property of having its bitter quality improved by keeping; the aroma however decreases.

The leaves of *Artanthe adunca*, Miquel (Nat. Ord. *Piperaceæ*), are very peculiar; they have the smell of dried Spearmint, and an agreeable aromatic taste. A tisane made of these leaves is in much favour with the French colonists, who call the drug Feuille Mal d'Estomac and employ it in cases of stomach diseases and in chlorosis.

The pods called Guatamare are the fruit of *Myrospermum frutescens* (*Leguminosæ*); they very much resemble those of *M. peruiferum* and *M. Pereiræ*, and, like them, contain aromatic balsamic qualities. The tree, too, yields a balsam scarcely distinguishable from Balsam of Peru. A tincture prepared from these pods is much in favour as a stomachic and carminative, and as an external application for rheumatic pains.

The roots of a species of *Scleria* (Nat. Ord. *Cyperaceæ*) are used as a stomachic and carminative; the flavour is warm, and most agreeably aromatic. There can be no doubt, if imported to this country, it would soon be liked as much as it is in Trinidad.

The dried flowers of *Brownea latifolia*, Jacquin (Nat. Ord. *Leguminosæ*), are much used by the Trinidad women as a styptic; they have a most agreeable smell, and well deserve attention in this country.

Another leguminous product will complete my list; it is the seed of *Cassia occidentalis*, the Stinkweed of the English, and Herbes-puantes of the French colonists; this seed and also the young tops of the plant are used as diuretics in dropsy; notwithstanding this medicinal quality, the seed is collected in the Argentine Republic and used as a substitute for coffee: perhaps the roasting destroys its diuretic character.

Besides those above described, there are several other medicinal products of Trinidad which I may perhaps bring under the notice of this Society on some future occasion.

At the close of the address a very cordial vote of thanks was given to Professor Archer for his interesting communication.

The deliverance of the Committee appointed to examine the essays which had been sent to the Secretary was then made known. The paper on 'Glycerine' was named as the best, and therefore entitled to the President's prize. On the sealed envelope being opened, the author's name was found to be F. Baden Benger, residing at Messrs. Bell and Co.'s, 338, Oxford Street, London. The work, Professor Nichol's 'Physical Sciences,' illustrated, was the prize given by the President, and the Secretary received instructions to forward the same. The second prize, Balfour's 'Manual of Botany,' was awarded to the author of the paper on 'Displacement,' who was James Burt, residing at Mr. Munday's, Worthing. There were other two essays which the Committee thought deserved recognition, and they therefore awarded a third prize to the writer of the essay upon 'Camphor,' viz. Balfour's 'Outlines of Botany,' and a fourth prize for the essay on 'Iodine,' the volume given for which was a copy of M. M. Edwards on 'Zoology,' with plates. The author of the former was J. G. Stevens, residing with Jeffreys and Sons, Cheltenham, and of the latter, Thomas Collier, with Mr. Collier, of Sheffield. The Committee remarked that Mr. Collier had borrowed largely from some writers on 'Iodine,' which they think Mr. C. ought to have acknowledged. On the whole, the essays were very creditable.

The President then gave his—

VALEDICTORY ADDRESS.

In accordance with what has always been the custom of the retiring President, I beg to offer you a few remarks, as in the course of a very few hours my successor will be appointed, and I shall cease to hold the honourable position in which you so kindly placed me twelve months ago.

In commencing, allow me to refer to what has been the real work of the bygone session. First, in regard to scientific meetings, we have had *five*, and these, on being glanced at, will, I am sure, bear favourable comparison with any previous session. In November we had a very lucid communication by Dr. Stevenson Macadam, on the Recent Progress of Organic Chemistry. Our Secretary exhibited in operation one of Carr's Patent Levigating Machines, and fifty specimens were added to our museum, the gift of the Council in London.

In February we had from Dr. James Young some remarks full of interest regarding "Cicutine Granules," and the "Freshwater Aquarium" was treated in a masterly style by Mr. Moffat, of Glasgow. At our next meeting Mr. Stevenson read an admirable paper, comprehending the new preparations in the British Pharmacopœia, which gave rise to a long and profitable discussion. About the close of March, Mr. Mackay introduced to our fourth meeting Robbins's "Oxygennesis," a new material for the immediate production of Oxygen gas, and Mr. D. R. Brown read a paper on "Volumetric Analysis," illustrated by interesting experiments.

Our fifth meeting is just closing, and I need scarcely refer to the very able and valuable communication which Professor Archer has so kindly given us this evening. To all the gentlemen who have thus assisted in keeping up the interest of these meetings my best thanks are tendered, and especially for the readiness with which they have come forward and contributed to our scientific gatherings. I am also glad to say that the attendance has been throughout the session most excellent.

During my year of office there have been four meetings for Examination, and it is pleasing to know, that applicants for admission are becoming more numerous. At the last meeting of the Board of Examiners, no fewer than six passed their Major examination, thus fitting them to be registered as Pharmaceutical Chemists, all of whom will doubtless be made Members of the Society, as their applications will come before the London Council at their next meeting.

I could have wished that the Library had been more freely used than it has been during the winter months. Every facility was given by the Curator, who attended regularly every alternate Tuesday evening, but he has, on the whole, received little encouragement. Many of the books have now been re-bound, and I really hope that in future a more satisfactory report may be given regarding this department.

I cannot but congratulate you on the production of the national Pharmacopœia. We have now had it before us for some time; and though there are many disposed to find

fault, and though its imperfections are talked of, and probably much magnified, I feel satisfied that on the whole it is indeed a great boon, and that very soon, when the new processes are more practised and better understood, full credit will be given to the compilers of the work, and that we shall all be brought to acknowledge its great value as a standard work, suited for every town and village in the United Kingdom.

It must be known to you all, that a movement is about to take place in favour of an extension of our Pharmacy Act. Of this it is perhaps too premature for me to speak at the present time, but from what I have heard, I feel convinced, that efforts will not be wanting on the part of those who are at the helm of affairs in London doing what they can to obtain an amended Pharmacy Bill, and, if successful, under the sanction of Government, carry out the original views of our Society, so as to give increased security to the public, and at the same time not overlook existing interests.

It only now remains for me to acknowledge the uniform kindness and forbearance with which those connected with the Society have at all times treated me (and particularly to our energetic and excellent Secretary, to whom I am deeply indebted for his invaluable assistance), and to state, that though retiring from the chair, my warmest wishes and endeavours will never be wanting to forward in every way the prosperity of the Pharmaceutical Society.

Intimation was made by the Secretary as to the summer arrangements in regard to the Library, and after a vote of thanks to the Chairman by Mr. KEMP the meeting adjourned.

The Annual Meeting of the Society was held in the New Café Royal Hotel, on Tuesday evening, 19th current, at a quarter-past 8 o'clock; Mr. G. BLANSHARD, President, in the chair.

The Secretary was requested to read the

ANNUAL REPORT, 1863-4.

At the close of another session, the Council beg to submit a Report of the proceedings of the Society, during the past year, as well as to lay before the meeting an abstract of the financial state of matters in connection with the Society here.

Five scientific meetings have been held, and these have had before them matters containing a full average amount of interest, and have all been exceedingly well attended. As usual, the Council take this opportunity to gratefully acknowledge, the kind assistance of those who have aided them in this department of the Society's labours.

The meetings for Examination have been four in number, and eleven have been added to the Society by this means. It is gratifying to know, that there is an increased feeling in favour of joining the Society, which the Council hope will, ere long, produce good fruit.

The Library and Museum still occupy the attention of the Council, but they regret to have occasion to complain of a want of sufficient interest in both these departments, and especially by those for whom the Library was chiefly instituted. Few books, comparatively, are taken out by the juniors, but the Council hope this notice of the fact, will induce parties to come forward, and take advantage of the privilege now accorded to all connected with the Society, of obtaining books, when application is made to the Librarian.

The Council are glad to recognize the appearance of the new Pharmacopœia. This publication has been in the hands of pharmaceutists for several weeks, and without attempting any criticism on the work, the Council cannot but express the pleasure and satisfaction they feel, in now possessing a national scientific compilation, emanating, as it has done, from a body of distinguished and talented gentlemen, who, by the production of this work, have done away with much that was incongruous and troublesome; and who, by the assimilation of the different processes throughout England, Scotland, and Ireland, have done good service in preventing disappointment to prescribers, as well as danger to patients, by the use of preparations which, alike in name, differed in strength, simply because a few miles of space intervened. The addition of new remedies and new formulæ are also hailed as boons, while many preparations, and even drugs, which have been long considered useless, and in some cases obsolete, have now been entirely expunged as officinal.

Four essays have been sent in competition for the President's Prize, but this subject has been fully referred to in the proceedings of the last scientific meeting of the session, and need not be again touched upon here, but for the purpose of intimating, that to associates and apprentices in England and Scotland, an opportunity will still be given for competition during the summer and winter months, as one or two prizes, according to the number and merit of the essays sent, will be awarded at the close of next session. All papers will require to be sent with sealed envelopes to the Secretary, not later than 1st March, 1865.

The following is a statement of account as from 1st January to 31st December, 1863.

Dr. *The Secretary in account current with the Society, December* 31*st*, 1863. *Cr.*

1863.		£	*s.*	*d.*	1863.		£	*s.*	*d.*
Sept. 1.	Cash from London	50	0	0		Paid Rent of Hall and Museum Room	30	0	0
Dec. 31.	Do. due Secretary	11	11	0		Insurance	0	7	6
						Books and publications for Library	4	4	9
						Museum	3	10	4
						Expenses, Annual Meeting	4	1	11
						Painting cases, etc., in Museum and Library	4	1	0
						Printing	6	8	0
						Postages	1	12	3
						Delivering Billets and Attendance	1	4	0
						Curator	5	0	0
						Paper, Envelopes, etc.	1	1	3
		£61	11	0			£61	11	0
					Dec. 31.	Amount due to Secretary	£11	11	0

We, the undersigned, have examined the foregoing accounts, with voucher attached, find them correctly stated and entered, and the balance due to the Secretary, at the 31st December, 1863, eleven pounds, eleven shillings.

James Gardner.
John B. Stephenson.
Wm. Ainslie.

Edinburgh, 16*th April*, 1864.

The Council think it right to make reference to the present movement, which they understand is now occupying the attention of the Council in London, regarding an extension of the Pharmacy Act of 1852. They think that the General Meeting of Members so recently held in London was a step in the right direction, and that no time should be lost in making every endeavour to get the provisions of the existing Bill extended; and they cannot but express strongly their belief, that the intention already intimated, to recognize in the proposed new measure existing interests, is one of the elements which will very much facilitate the introduction of this enlarged Bill. By the proposed mode of registration in the case of *bonâ fide* chemists and druggists now in business, and a compulsory examination in all time to come, of those who may desire to commence business, the public will in some degree be protected against incompetent parties dispensing prescriptions, while justice will be done alike to the medical practitioner, the chemist himself, and his patrons. By such an arrangement the pharmaceutical chemist would still remain as before, and additions from time to time be made by those who, by a higher and more strict examinations, were found qualified to be registered as such. The Council here are therefore quite prepared to give their brethren in London all the assistance in their power in carrying forward the proposed measure. Doubtless there will be much to overcome and arrange, before the whole matter can be finally carried, but there can be little doubt of ultimate success if persevering exertions are made in the proper quarter.

In concluding this Report, thanks are tendered to the London Council for their kind presentation of the duplicate specimens to the Museum here in November last.

Edinburgh, 19*th April*, 1864.

This was unanimously approved of, and the Meeting then proceeded to elect Office-bearers for 1864–5, when the following were chosen:—

LIST OF OFFICE-BEARERS.

President.—Mr. Kemp (Portobello).

Vice-President.—Mr. D. R. Brown (of Macfarlan and Co.).

Council.—President, Vice-President, G. Blanshard, Smith (Kilmarnock), Flockhart, Aitken, Borland (Kilmarnock), Govan (St. Andrew's), Noble, Gardner, Raimes, Ainslie, Stephenson, Tait, Young.

Examiners.—President and Vice-President, Messrs. Blanshard, Gardner, Aitken, Stephenson, Ainslie, and Tait, with the President and Vice-President in London, and Secretary in Edinburgh, *ex officiis.*

Curator.—Mr. W. Hill.

Library and Museum Committee.—The President and Vice-President, and Messrs. Stephenson, Ainslie, and Young.

Secretary.—Mr. John Mackay.

Member of Council in London.—Mr. Mackay was recommended again for election.

After the meeting, the Members, Associates, and their friends supped together in the large new hall of the Café. There were about 100 present. Apologies were received from several medical gentlemen and country members. Bailie Kemp (of Portobello), the President elect, occupied the chair, supported by Professor Archer, Dr. James Young, Dr. Adams, Mr. A. Young, etc. etc., and Mr. D. R. Brown, Vice-President, acted as croupier. There were several excellent songs sung during the evening, and it seemed to be a general feeling that this social meeting had been one of the most pleasing and successful ever held under the auspices of the Society. The following toasts were given and responded to:—"The Queen;" "The Prince and Princess of Wales and other Members of the Royal Family;" "The Navy, Army, and Volunteers," responded to by Mr. Blanshard; "The Pharmaceutical Society;" "The Lord Provost, Magistrates, and Town Council of Edinburgh;" "The Royal Colleges of Physicians and Surgeons;" "Professor Archer," by Mr. Blanshard and responded to by Professor Archer; "The President and Council, London," by Mr. Young, responded to by Mr. Mackay; "The Memory of Jacob Bell," by Professor Archer; "The Retiring President," by Mr. Aitken, responded to by Mr. Blanshard; "The Scotch Universities," by Dr. Young; "Dr. Macadam, and the other Honorary Members in Scotland," by Mr. Stephenson; "The Chairman," by Mr. Noble; "The Croupier," by Mr. Ainslie; "The Secretary," by Mr. Brown, responded to by Mr. Mackay; "The Youngest Apprentice Present," by Professor Archer, responded to by Mr. Napier, junior.

PROVINCIAL TRANSACTIONS.

LEEDS CHEMISTS' ASSOCIATION.

The Eighth Meeting of the session was held at the School of Art, on the evening of April 13th; the President, Mr. Harvey, in the chair.

A chart of the weights and measures of the metric system, which had been presented to the Industrial Museum at Leeds by Mr. Yates, F.R.S., was exhibited and described by the President. Thonger's Poison Labels were also laid upon the table.

Mr. D. H. Cussons (Associate) read a paper upon "French Pharmacy." The information given was primarily derived from the personal experience of the author, when a few years since holding the post of manager of the English department of a *pharmacie* in Paris.

Mr. Cussons described the legal status of the two classes dealing in drugs, viz. the *pharmacien* and the *droguiste* or *épicier*. The *droguiste* may be briefly dismissed from notice, since his functions are very limited, and do not permit him to dispense prescriptions, or to sell any compound preparations. The *pharmacien*, on the other hand, enjoys the full confidence of the State, and is invested with the privileges which it can bestow. But in return for these he must give a *quid pro quo* by completing a curriculum of prescribed study, which extends over several years. A student (*élève*) must first produce a certificate of examination from one of the elementary State schools, attesting his proficiency in the ordinary branches of a liberal education. He then becomes the pupil of a *pharmacien* for three years, at the expiry of which he may present himself for examination in pharmaceutical chemistry, dispensing, etc., and becomes entitled to act as an assistant. In three years more he may enter as a student at

either of the three national *écoles de pharmacie*, in Paris, Strasbourg, or Montpellier. The period of study is two years, and the subjects embraced are chemistry, theoretical and practical pharmacy, the natural history sciences, toxicology, etc. The ordinary age required in a candidate for examination is 25 years.

The author gave a graphic sketch of the arrangements of a *pharmacie* in Paris. There is small attempt at display in the fittings of the shop, and since the *etceteras* which enter so largely into a chemist's stock in England are not recognized by the *pharmacien*, there is nothing attractive in the drugs and preparations. The learned principal takes business very easily, in a costume which comprises a dressing-gown and smoking-cap, whilst Madame performs the duties of cashier and clerk.

In dispensing prescriptions (*ordonnances*) the label usually indicates no more than "*Potion selon la formule*, No. 100," and since the prescription is written in French, the patient may refer to the original for instructions as to taking the medicine.

All liquids bear, further, a second label, "*Pour l'usage interne*" (on coloured paper, and placed beneath the ordinary label), or, "*Pour l'usage externe*" (placed above the ordinary label).

A fixed tariff of charges exists, and also a register of prescriptions, in which must be entered full particulars of each that is dispensed. This book is inspected from time to time, and the same may be said of the stock of drugs, the examiners having the power to confiscate any deteriorated or inferior medicines.

The greater regard for the agreeable held by our neighbours, is shown in the large number of syrups, of which one hundred are officinal, besides saccharated remedies of many kinds, as *pâtes*, pastilles, etc.

The tinctures of the Codex are generally much stronger than corresponding ones of this country.

Infusions are rarely used in the position they occupy here, but in their stead the simple materials for preparing them are sent to the patient for the preparation of the *tisane*, used as a vehicle for the more active medicine. Tea is one of the ingredients for a *tisane* thus dispensed by the *pharmacien*, its use as a beverage being comparatively unknown in coffee-loving France.

Pills are usually made of 3 or 4 grains weight. The ordinary aperient pill is made from the Codex formula, with equal quantities of aloes and powdered acacia, flavoured with oil of anise. The name *Pilules Ecossaises* is generally applied to them.

Henry's magnesia is a medicine of high repute, but it is a common practice to substitute ordinary magnesia packed in bottles, with the name of "W. and J. Henry, Manchester," upon the glass, and a counterfeit stamp over the cork.

The graduated measure-glass is not employed, fluids being ordered by weight, and directly weighed into the phials standing upon the scales. As is well known, the metric system of weights is alone employed.

The author replied to several inquiries that were made, and upon the motion of Mr. Yewdall, seconded by Mr. Aldridge, the best thanks of the meeting were awarded for his interesting communication.

NOTTINGHAM CHEMISTS' ASSOCIATION.

The Seventh General Meeting was held in the Society's Room, Exchange Buildings, on Wednesday evening, the 13th inst.; Mr. S. PARR, the President, in the chair.

The following donations were announced:—

'Tyndall on Heat as a Mode of Motion,' from the Rev. E. H. Vernon; the 'Journal,' from the Pharmaceutical Society; the 'Chemical News' and the 'Chemist and Druggist,' from the respective editors; 'Illustrated Catalogue of the Trades' Museum,' from Mr. Simmonds; and a guinea from an hon. member.

The PRESIDENT then introduced Mr. Heathfield, F.R.G.S., who read a most elaborate paper on "Water," in which its history and chemical properties were related in a most comprehensive manner.

At the conclusion of the paper a discussion took place on the subject.

Mr. PARR doubted whether water could be or ever had been reduced in volume by pressure, maintaining that it is the air only contained in the water which is compressible, and not the water itself.

Mr. HEATHFIELD, in reply, stated that as early as the seventeenth century it had been proved that a pressure of 30,000 lbs. on the square inch had caused a reduction of volume of about one-twelfth, which had been since corroborated, by the experiments of eminent philosophers; and alluding further to Mr. Parr's remarks, Mr. Heathfield stated that there was a difference between the compressibility of water and its well-known reduction in volume by the decrease of temperature.

Mr. APPLEBY STEPHENSON, in proposing a vote of thanks to Mr. Heathfield, spoke in eulogistic terms of the value of the paper.

The vote was seconded by Dr. Tatham, and carried unanimously.

Mr. J. H. ATHERTON, F.C.S., then read his second paper on the 'British Pharmacopœia.'

Mr. HEATHFIELD, in proposing a vote of thanks to Mr. Atherton, alluded to the practical value of these papers. He thought it reflected great credit not only on the promoters of the Society, but on the gentleman who undertook to get up papers of such practical importance, which not only required a considerable amount of time and trouble, but also of study. He regretted that time would not allow of much discussion, but he must say as a manufacturer of considerable experience, that the processes in the Pharmacopœias had no practical value.

Mr. PARKER having briefly seconded the vote of thanks, which was carried unanimously, the meeting terminated.

LEGISLATION AFFECTING PHARMACY.—MEETING OF CHEMISTS AND DRUGGISTS, DUDLEY.

An adjourned meeting of the chemists and druggists of Dudley and its vicinity was held in the lecture hall of the Mechanics' Institution on Thursday, April 7th. The meetting was again presided over by Mr. E. Hollier, pharmaceutical chemist, Dudley, and between twenty and thirty chemists were present, including Messrs. Alsop, Bell, Bishop, Bradley, G. B. Bradley, Bache, Gare, Johnson, Jones, Horton, Nicklin, Nock, Owen, Roberts, Rooker, Swinerton, Tomkyss, Tunley, Voce, Wilshaw, White, etc. Letters were read from Messrs. Bagott, Thompson, Bew, Kearns, Geary, and others, expressing regret at being unable to attend, and of their entire sympathy with the objects of the meeting. The Chairman said that they had then met in accordance with a resolution of the previous meeting, and a promise on his own part to summon them again together when anything definite was known, either as regarded the proposed Medical Act, or the result of the special meeting of the Pharmaceutical Society. As to the first, he was glad to say that the medical council had abandoned all further legislation, and had thus left the field open for the action of their own body. One good, if no other, had arisen from the agitation of the proposed enactment of the Medical Council, it had brought the chemists and druggists again to act together for one common end, and if this were done unitedly, and with an earnest and sincere purpose to elevate and advance, as well as to oppose any interference with their trade, he had no doubt it would result most advantageously for the general interest. The Medical Council had recognised the necessity of a proper educational status on the part of those who prepared and dispensed medicines, and thus by implication that it was neither wise nor just to leave this to be done by ignorant and pretending persons. It was seeing this, but still wishing that legislation, as to their own educational standing, should be in their hands rather than in that of another body, which had led others as well as himself to conceive that an opportune moment had arrived for bringing the matter strongly before the Pharmaceutical Council, and that a successful application might now be made to Parliament for an extended and amended Pharmacy Act. Accordingly, a requisition had been presented to the Council, signed by about 300 members, including something like 80 examined ones, thus showing that this important portion of the Society did not look upon the motion with that jealousy which it has been supposed they would have done. A special meeting was held on the 17th of March, when it was resolved, by a large majority, in a very influential and intelligent meeting, that such an Act should at once be applied for. Anticipating the probability of such a conclusion, the Council had prepared a rough draft of a proposed bill, the heads of which were read over, and would be found, together with the account of the meeting, in the previous month's 'Pharmaceutical Journal.' And if any amongst them, for the sake of the admirably-written articles and general information it contained, in regard to

all medical and chemical matters, took in the 'Lancet,' they would find the leading points of the Act, with some very judicious remarks, in last week's number of that periodical. The Chairman went on to say that he augured well for the success of their application to Parliament, when it was thus supported in the leading medical journals. He read the heads of the proposed Bill, commenting upon, and pointing out the parts which would constitute the distinctions between the "Pharmaceutical Chemist" and the "Chemist and Druggist." The Bill proposed "That, after a certain date, all existing chemists and druggists should be registered as such, upon payment of a fee of one guinea, and that no person should keep open a shop for dispensing prescriptions unless registered as a pharmaceutical chemist under the Pharmacy Act, or as a chemist and druggist under the proposed Act. That the examiners and registrars should be the same under both Acts, and that power over these should be in the hands of the Pharmaceutical Council; that a due register should be kept and published annually, and penalties incurred on its falsification, or obtaining registration by false representation, and for keeping open shop for dispensing prescriptions without being registered. The Act also provides for evidence of qualification to be given before registration, and of examination on the part of those who shall commence business after the coming into operation of the Act; also as to assistants and associates under the Pharmacy Act, to the reservation of the rights of medical men, and the administration of the Benevolent Fund."

The CHAIRMAN remarked that as he hoped the Bill would be printed ere long, all would then have an opportunity of considering its provisions, which he hoped would be such as to satisfy and convince them of its being worthy of their hearty support. In reply to queries as to the admission by chemists to a full participation in the advantages to be derived from membership with the Pharmaceutical Society, Mr. Hollier expressed his hope that with the obtaining of an Act for registration of all chemists and druggists, the Council would, at the same time, obtain the alteration of their bye-laws, which could be done (to a certain extent) with the sanction of the Secretary of State, by which they would be able to admit, under definite restrictions, those chemists of a certain standing who aspired to the higher title as members of the Society, without the necessity of an examination. He thought this might be done without in any degree lowering the status of the Society. In reply to inquiries as to whether the United Society intended to apply for an Act of registration or incorporation, the Chairman stated he knew nothing. He conceived it would be far better to *act unitedly* for the obtaining of an extended Pharmacy Act, than for two, and perhaps fail to obtain either, especially when no Act the United Society would be likely to get would give them more advantages than those proposed by by that of the Pharmaceutical Council. Some other discussion ensued, when Mr. Jones proposed the following resolution:—

"That this meeting learns with great satisfaction that the Medical Council have abandoned all further legislation in regard to the proposed amended Medical Bill, many of the clauses of which has called forth so unanimous an opposition and condemnation of the chemists of this kingdom, as an unjust and uncalled-for interference with their rights and privileges; and this meeting would still further express its satisfaction that the Pharmaceutical Council have, in accordance with a resolution passed at a special meeting of their Society, on the 17th March, determined to apply to Parliament for an amended Pharmacy Act, and this meeting pledges itself to support by every means in its power the endeavour to obtain such an act, which shall have for its object to provide for a proper educational qualification on the part of those who shall prepare, compound, or dispense medicines, with, at the same time, a reservation of the existing rights of all those who may be now or shall be at some future time to be named, in such an Act, engaged in the trade or profession of a chemist."

He remarked that if the Pharmaceutical Society dealt as fairly and as liberally with the general body of chemists and druggists as the Chairman expressed, it would meet with their hearty and earnest support.

This was seconded by Mr. BISHOP, and carried unanimously.

It was proposed by Mr. SWINNERTON that copies of the resolution, as well as an account of this meeting, be forwarded to the editor of the 'Pharmaceutical Journal,' and of the 'Chemist and Druggist,' with the hope that they would give to it, by their publications, an equal and extended publicity as to that of the former meeting held in this room.

This was seconded by Mr. GARE, and carried.

It was then proposed by Mr. BISHOP, and seconded by Mr. BELL, "That the best thanks

of the meeting be given to the Chairman for his conduct in the chair that day, and for the trouble he had taken in thus affording them so much valuable information as to their position in regard to the Pharmaceutical Society, and of the abandonment of the proposed amendments of the Medical Council's Act."

A general wish was expressed that Mr. Hollier would take the trouble of calling them together at any time when he conceived there was a need for it, and Mr Bell remarked that he was sure their Chairman would be well supported in his endeavours thus to advance the interests of their profession. Mr. Bache remarked that as those meetings could not be called without some expenses being incurred, it was hardly fair these should fall upon the Chairman; he would therefore suggest that a subscription should be made in order to defray them. This was at once done, and subscriptions raised, which, with that promised by letter, would fully cover all the expenditure.

After the especial business of the meeting was concluded, a conversation took place respecting some of the alterations in the new Pharmacopœia, many of which were unanimously condemned by the chemists present. Extracts were read from the 'Lancet,' and reference made to the lectures by Professors Bentley and Redwood, respecting them, and which the Chairman recommended to the attention of all present who had not seen them. As far as Dudley was concerned, the great and possibly dangerous inconveniences arising from the alterations were to some extent a dead letter, by several of the medical profession declaring it to be their intention chiefly to adhere to the preparations of the London Pharmacopœia.

A BILL FOR REGULATING THE QUALIFICATIONS OF CHEMISTS AND DRUGGISTS.

Whereas it is expedient for the safety of the public that persons carrying on the business of a chemist and druggist by retail, in the keeping of open shop for the compounding of the prescriptions of duly qualified medical practitioners, should possess a competent practical knowledge of such business, and to that end, that from and after the day herein named, all persons, before commencing such business, should be duly examined as to their skill and knowledge, and that a Register should be established and kept of all such persons, and also of all persons on or before such day carrying on such business; and also that the Act passed in the 15th and 16th years of the reign of Her present Majesty, intituled An Act for Regulating the Qualifications of Pharmaceutical Chemists, hereinafter described as the Pharmacy Act, should be amended: Be it enacted, by the Queen's Most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal and Commons in this present Parliament assembled, and by authority of the same:

After the 1st January, 1865, all chemists and druggists, if not Pharmaceutical Chemists, to be examined.—Saving rights of Chemists and Druggists then in business.

1. From and after the 1st day of January, 1865, it shall not be lawful for any person to carry on the business of a chemist and druggist, in the keeping of open shop for the compounding of the prescriptions of duly qualified medical practitioners, in any part of Great Britain, unless such person shall be a Pharmaceutical Chemist, or shall be duly registered as a Chemist and Druggist under this Act, and no person shall be registered as a Chemist and Druggist under this Act unless he shall have theretofore carried on business as a chemist and druggist, or shall have been registered as an Assistant as herein provided, or shall have been examined by examiners and have received a certificate of competent skill and knowledge, and also shall have attained the full age of twenty-one years.

Examiners under Pharmacy Act to be the Examiners under this Act.—Certificate of competent skill, etc.

2. All such persons as shall from time to time be appointed to conduct examinations under the Pharmacy Act shall be and are hereby declared to be examiners for the purposes of this Act; and a certificate of competent skill and knowledge, and qualification to be registered as an Assistant under the said Pharmacy Act, shall be deemed to be a certificate of competent skill and knowledge within the meaning of this Act.

Registrar under Pharmacy Act to be Registrar under this Act.

3. The Registrar appointed or to be appointed under or by virtue of the Pharmacy Act shall be the Registrar for the purposes of this Act.

Chemists and Druggists in business in Great Britain before 1st January, 1865, entitled to be registered as Chemists and Druggists.

4. Any person who, before the passing of this Act, has been, or who, on the 1st day of January, 1865, shall be actually carrying on business in Great Britain as a chemist and druggist, in the keeping of open shop for the compounding of the prescriptions of duly qualified medical practitioners, shall, on payment of a fee not exceeding One Guinea, to be fixed by the Council of the Pharmaceutical Society of Great Britain, be entitled to be registered on producing to the Registrar a declaration according to the form in the Schedule B. to this Act, signed by him, and also a declaration according to the form in the Schedule C. to this Act, signed by a duly qualified medical practitioner, or upon transmitting to such Registrar information of his name and address, and enclosing such declarations as aforesaid.

Assistants may be registered as "Assistants" under Pharmacy Act.

5. Every person who before the passing of this Act has been actually engaged and employed as an Assistant to any "Pharmaceutical Chemist" or to any "Chemist and Druggist" in Great Britain, and has attained the age of twenty-one years, and who shall, prior to the 1st day of January, 1865, present or cause to be presented to the said Registrar a certificate according to the form set forth in Schedule D. to this Act, signed by himself and by two persons registered as Pharmaceutical Chemists or registered or entitled to be registered as Chemists and Druggists, shall be entitled, on payment of a fee of Five Shillings, to be registered as an Assistant under or according to the provisions of the Pharmacy Act.

Assistants and Associates under Pharmacy Act may become Chemists and Druggists, and so registered on commencing business.

6. All persons who are or shall be duly registered as Assistants or Associates under or according to the provisions of the Pharmacy Act, shall, on commencing business as chemists and druggists, be registered as Chemists and Druggists on payment of a fee not exceeding One Guinea, to be fixed by the Council of the Pharmaceutical Society of Great Britain.

Council of Pharmaceutical Society to make Orders for regulating Registers to be kept.

7. The Council of the Pharmaceutical Society of Great Britain shall, with all convenient speed after the passing of this Act, and from time to time as occasion may require, make orders or regulations for regulating the Register to be kept under this Act, as nearly as conveniently may be in accordance with the form set forth in the Schedule A. to this Act or to the like effect.

Duty of Registrar to make and keep correct Registers.

8. It shall be the duty of the Registrar to make and keep a correct Register, in accordance with the provisions of this Act, of all persons who, on the 1st day of January, 1865, shall have been or shall be carrying on the business of a chemist and druggist, in the keeping of open shop for the compounding of the prescriptions of duly qualified medical practitioners, and also of all persons who shall have been or shall be examined by examiners, and have received a certificate of competent skill and knowledge, and have commenced business as chemists and druggists, and also of all persons who shall be registered as Assistants under or according to the provisions of the Pharmacy Act, and to erase the names of all registered persons who shall have died, and from time to time to make the necessary alterations in the addresses of the persons registered under this Act; and to enable the Registrar duly to fulfil the duties imposed upon him, it shall be lawful for the Registrar to write a letter to any registered person, addressed to him according to his address on the Register, to inquire whether he has ceased to carry on business or has changed his residence, and if no answer shall be returned to such letter within the period of six months from the sending of the letter, it shall be lawful to erase the name of such person from the Register: Provided always, that the same may be restored by direction of the Council of the Pharmaceutical Society of Great Britain, should they think fit to make an order to that effect.

Evidence of qualification to be given before registration.

9. No name shall be entered in the Register unless the Registrar be satisfied by the proper evidence that the person claiming is entitled to it; and any appeal from the decision of the Registrar may be decided by the Council of the Pharmaceutical Society of Great Britain; and any entry which shall be proved to the satisfaction of such Council to have been fraudulently or incorrectly made, may be erased from or amended in the Register by order in writing of such Council.

10. The Registrar shall in every year cause to be printed, published, and sold, a correct Register of the names of all Pharmaceutical Chemists, and a correct Register of all persons entitled to carry on the business of Chemists and Druggists, and in such registers respectively the names shall be in alphabetical order according to the surnames, with the respective residences, in the form set forth in Schedule A. to this Act, or to the like effect, of all persons appearing on the Register of Pharmaceutical Chemists and on the Register of persons entitled to carry on the business of Chemists and Druggists, on the 1st day of January in every year, and such Registers shall be called "The Register of Pharmaceutical Chemists and Chemists and Druggists;" and a copy of such Registers for the time being, purporting to be so printed and published as aforesaid, shall be evidence in all Courts and before all Justices of the Peace and others, that the persons therein specified are registered according to the provisions of the Pharmacy Act and of this Act respectively; and the absence of the name of any person from such copy shall be evidence, until the contrary shall be made to appear, that such person is not registered according to the provisions of the Pharmacy Act or of this Act.

Annual Register to be published and be evidence.

11. Any Registrar who shall wilfully make or cause to be made any falsification in any matter relating to the said Registers, shall be deemed guilty of a misdemeanour in England, and in Scotland of a crime or offence punishable by fine or imprisonment, and shall on conviction thereof be imprisoned for any term not exceeding twelve months.

Penalty on wilful falsification of Register.

12. If any person shall wilfully procure or attempt to procure himself to be registered under the Pharmacy Act or under this Act, by making or producing, or causing to be made or produced, any false or fraudulent representation or declaration, either verbally or in writing, every such person so offending, and every person aiding or assisting him therein, shall be deemed guilty of a misdemeanour in England, and in Scotland of a crime or offence punishable by fine or imprisonment, and shall, on conviction thereof, be sentenced to be imprisoned for any term not exceeding twelve months.

Penalty for obtaining registration by false representations.

13. Any person keeping open shop for the sale or compounding of drugs by retail, who shall wilfully and falsely pretend to be, or take, use, or exhibit the name or title of a Pharmaceutical Chemist, or Chemist and Druggist, or Chemist, or Druggist, or any name, title, addition, or description, implying that he is registered under the Pharmacy Act or this Act, or that he is recognized by law as a pharmaceutical chemist or a chemist and druggist, and any person, not duly registered as a Pharmaceutical Chemist or a Chemist and Druggist, who shall keep open shop for the compounding of the prescriptions of any duly qualified medical practitioner, shall for every such offence be liable to pay a penalty or sum of £5.

Penalty for falsely pretending to be a registered person, or keeping open shop for dispensing said prescriptions, not being registered.

14. The several fees payable under and by virtue of this Act shall be paid to the Treasurer of the Pharmaceutical Society of Great Britain for the purposes of the said Society.

Application of fees to purposes of Pharmaceutical Society.

15. Any sum or sums of money arising from the recovery of penalties as aforesaid shall be paid as the Commissioners of Her Majesty's Treasury shall direct, and the same may be sued for and recovered in the manner provided by the Pharmacy Act for the recovery of penalties under that Act.

Application of penalties as Secretary of State may direct.

16. Every person duly registered as a chemist and druggist, and having (whether before or after such registration) been examined and certified as aforesaid, shall be eligible to continue or to be elected an Associate as aforesaid, and may publicly use the title or description, Associate of the Pharmaceutical Society of Great Britain; and every such person so continuing or elected as such Associate, shall have the privilege of attending all meetings of the said Society, and of voting thereat, and otherwise taking part in the proceedings of such meetings in the same manner as Members of the said Society, but shall not have or exercise any other of the rights or privileges of such members.

Registered chemists and druggists having passed Minor examination, may be elected as and continue and use title of Associate of Pharmaceutical Society, and may vote at meetings of the Society.

17. Nothing in this Act contained shall extend, or be construed to ex-

Saving of rights of duly qualified Medical Practitioners.

tend, to lessen or prejudice, or in anywise to interfere with, any of the rights, authorities, privileges, and immunities heretofore vested in and exercised and enjoyed by any duly qualified medical practitioner.

Benevolent Fund may be applied to past Members and Associates, also to Pharmaceutical Chemists and registered chemists and druggists.

18. And whereas by the Charter of Incorporation of the said Pharmaceutical Society of Great Britain it is provided that the Council of the said Society shall have the sole control and management of the real and personal property of the said Society, subject to the bye-laws thereof, and shall make provision thereout, or out of such part thereof as they shall think proper, for the relief of the distressed Members or Associates of the said Society and their widows and orphans, subject to the regulations and bye-laws of the said Society; and whereas, for extending the benefits which have resulted from the said provision in the said Charter of Incorporation, it is desirable that additional power should be granted to the said Council: Be it enacted, that from and after the said 1st day of January, 1865, the said Council may make provision out of the real and personal property aforesaid, and out of any special fund known as the Benevolent Fund, not only for the relief of the distressed Members or Associates of the said Society and their widows and orphans, subject to the said regulations and bye-laws, but also for all persons who may have been and have ceased to be Members or Associates of the said Society, or who may be or have been duly registered as "Pharmaceutical Chemists" or "Chemists and Druggists," and the widows and orphans of such persons, subject to the regulations and bye-laws of the said Society.

Title of Act.

19. This Act may be described as The Pharmacy Act, 1864.

SCHEDULE A.

Name.	Residence.	Qualification.
A. B.	Oxford Street, London.	In business prior to January, 1865.
C. D.	George Street, Edinburgh.	Examined and certified.

SCHEDULE B.

Declaration required of a person who claims to be registered as a Chemist and Druggist, upon the ground that he was in business as a Chemist and Druggist in Great Britain before the 1st day of January, 1865.

To the Registrar of the Pharmaceutical Society of Great Britain.

I, , residing at , in the County of , hereby declare that I was in business as a Chemist and Druggist, in the keeping of open shop for the compounding of the Prescriptions of duly qualified Medical Practitioners at , in the County of , on or before the 1st day of January, 1865.

Signed (Name.)

Dated this day of , 18 .

SCHEDULE C.

Declaration to be signed by a duly qualified Medical Practitioner respecting a person who claims to be registered as a Chemist and Druggist, upon the ground that he was in business as a Chemist and Druggist in Great Britain before the 1st day of January, 1865.

To the Registrar of the Pharmaceutical Society of Great Britain.

I, , residing at , in the County of , hereby declare that I am a duly qualified Medical Practitioner, and that to my knowledge , residing at , in the County of , was in business as a Chemist and Druggist, and in the keeping of open shop for the compounding of the Prescriptions of duly qualified Medical Practitioners before the 1st day of January, 1865.

Signed

SCHEDULE D.

To the Registrar of the Pharmaceutical Society of Great Britain.

We hereby declare that the undersigned , residing at , in the County of , had before the passing of the Pharmacy Act, 1864, been actually employed as an Assistant to a Pharmaceutical Chemist or Chemist and Druggist, and attained the age of twenty-one years.

As witness our hands, this day of , 1864.

A. B., Assistant.
C. D., Pharmaceutical Chemist.
E. F., Chemist and Druggist.

LECTURES ON THE BRITISH PHARMACOPŒIA.

ON THE RELATION OF THE BRITISH PHARMACOPŒIA TO PHARMACOLOGY.

Lecture I.

Delivered before the Members of the Pharmaceutical Society, April 13, 1864.

BY DR. JOHN ATTFIELD, F.C.S.,
DIRECTOR OF THE SOCIETY'S LABORATORIES.

The new Pharmacopœia—published under the auspices of the General Council of Medical Education and Registration of the United Kingdom as the first great drug-book that, to the exclusion of every other, is destined to be used by all Medical Practitioners, Apothecaries, and Pharmaceutic Chemists throughout the whole British Empire—demands from the professed leaders in Pharmacy close and accurate critical examination. To facilitate the construction of this volume, its authors have had the opportunity of consulting the researches of gentlemen, who, inasmuch as they are learned in the science of Pharmacy, as well as practised in its art, may be called Pharmacologists as well as Pharmaceutists. If this, the first duty of authorship in the compilation of a book, the chief characteristic of which is, that it is a collection of descriptions of processes to be followed in the preparation of medicines, each process having been perfected probably by the joint labour of many workers; if this, the first duty of the authors of such a book, has been carefully performed, then, and then only, may we regard the new Pharmacopœia as the exponent of modern British Pharmacy, and as one of the most important contributions that have ever been made to the advancement of Pharmacology. My colleagues have given you critical and explanatory lectures on the Chemical and Galenical Processes and Preparations, and on the Organic Materia Medica of the Pharmacopœia; I propose to examine it chiefly in its relations to Pharmacological Investigation, that is, to point out the instances in which its authors have, and have not, taken advantage of the published suggestions of those engaged in practising pharmacy. In order, moreover, to make this course of lectures as useful as possible to the Members of the Pharmaceutical Society and to the readers of the Pharmaceutical Journal, I also shall include explanatory notes wherever I may consider them to be necessary. Without further preface then, and following the alphabetical arrangement of the Pharmacopœia itself, I shall at once proceed to the detailed consideration of the preparations it may be desirable to notice.

Acidum Aceticum.—In this, the first of the fourteen officinal acids, we have an excellent illustration of the advantages derived from the publication of the British Pharmacopœia, the old twelve varieties of acetic acid having been reduced in number to three. It is true that one of the three, *Acidum Aceticum Glaciale*, might also have been omitted; at the same time it must be remembered, that as it

was in both the Edinburgh and Dublin Pharmacopœias, its exclusion could not fairly be insisted on. Should its medicinal use become more general than at present, it will probably be retained in a future edition of the British Pharmacopœia; in that case, the process given for its preparation will doubtless be improved. It is said to be successfully manufactured on the Continent by Melsen's method, which consists in distilling binacetate of potash at a temperature which may vary from 300° Fahr. to 550° Fahr. (International Exhibition; Jurors' Report, Class II., Section A., and Chem. News, vol. ix. p. 58).

Acidum Benzoicum.—The process given for the preparation of benzoic acid, namely, heating benzoin in a subliming apparatus, has been frequently proved to be a wasteful one, much acid remaining in the non-volatile residue. It is the Edinburgh and Dublin process, but has been much improved since the last Pharmacopœias of those cities were published, and it is to be regretted that the British Pharmacopœia does not exhibit the improvement. If the benzoin be boiled with lime and the resulting solution be treated with hydrochloric acid, a precipitate is obtained, which yields on sublimation nearly all the benzoic acid originally present in the resin.

Acidum Citricum.—In the method for obtaining *Acidum Citricum*, the British Pharmacopœia does exhibit the improvements which have been made of late years in the manufacture of this acid; the lemon juice being now ordered to be fermented before the citric acid is taken out of it by the addition of the carbonate of lime. Personne has, however, observed (Pharm. Journ. vol. xii. p. 548), that citrate of lime itself ferments and yields acetic and butyric, as well as carbonic acids, so that it is important to observe, as a note to the Pharmacopœia process, that fermentation must be quite complete before the carbonate of lime is added.

Acidum Hydrochloricum.—The framers of the British Pharmacopœia have been sharply reproved, for having, in the directions for preparing *Acidum Hydrochloricum*, page 167 of the octavo edition, omitted all mention of the application of that heat, without which certainly but little acid will be obtained. In explanation of the omission, I have been told by a high authority that the little word "distil" was accidentally left out from the end of the fourth line on that page. [The error is corrected in the smaller edition recently published.]

Acidum Hydrocyanicum Dilutum.—Many processes have been recommended for the preparation of this acid, but that of the three old Pharmacopœias has, I think, been wisely retained. The product is not absolutely pure, as it contains a trace of sulphuric acid, but it has the advantage of being far more stable than a pure acid would be,—a fact long well known but only recently explained. Millon (Comptes Rendus, vol. liii. p. 842) has shown that the alteration which the pure acid is so apt to undergo is caused by the formation of ammonia; that a bubble or two of ammoniacal gas would in two or three days completely change many thousand times its weight of hydrocyanic acid; and that the presence of other acids or acidifiable matter preserves hydrocyanic acid either by neutralizing ammonia as soon as it is formed or by preventing its formation. The dilute hydrocyanic acid of the London Pharmacopœia contained two per cent. of real acid, that of the Dublin book was rather stronger, while the Edinburgh form contained nearly four per cent. The strength of the national acid has been fixed at the old London percentage, and we thus now have this most important medicinal agent of uniform strength in the three kingdoms.

Acidum Nitricum.—In the strength of *Acidum Nitricum* the English preparation has had to give place to that of Scotland and Ireland. It is to be regretted that the Dublin Section of the Pharmacopœia Committee did not profit by Redwood's critical remarks (Pharm. Journ. vol. x. p. 391) on the last Irish Pharmacopœia. He said, "a weaker acid would keep better, and would answer every purpose required in pharmacy." Possibly they thought they had made

concession enough in omitting the word *purum* from the name of their acid; for Redwood also said, "the name *acidum nitricum purum* is a misnomer, for however pure the acid may be when first prepared, it soon becomes contaminated with nitrous acid." According to the principal Editor of the British Pharmacopœia (Lancet, 1864, vol. i. p. 137), the chemistry of the work was entrusted to two gentlemen, one a Member of the Edinburgh, the other of the Dublin sub-committee; in this circumstance perhaps is to be found an explanation of the predilection evinced for that nitric acid which the compilers of the last London Pharmacopœia had rejected as inconvenient, unstable, and in every respect disadvantageous in comparison with the weaker one they in that work adopted. A writer in the 'Medical Times and Gazette,' 1864, vol. i. p. 291, states that two conflagrations have occurred through this strong nitric acid having come into contact with straw during transportation; it is to be hoped, therefore, that by way of relieving any anxiety that such a statement might produce, our northern manufacturers will soon give us the result of their experience of the packing and carriage of this acid.

ACIDUM PHOSPHORICUM DILUTUM.—The old process, oxidizing phosphorus by nitric acid, is retained. This is not a satisfactory process; a great explosion once occurred (Chem. News, vol. iv. p. 83) while performing it. Elsner, who relates the circumstance, supposed that the cause was the sudden evolution and combustion of phosphoretted hydrogen, a product of the decomposition of phosphorous acid vapour into that gas and phosphoric acid; he recommends that the operation be performed in an open dish, a precaution that might well have been adopted in the Pharmacopœia description of the process; for the use of the glass retort and Liebig's condenser there recommended is simply to economize nitric acid. It is true, that if made in an open vessel the product would be more likely to vary in strength than if made in a retort, and the process would still be open to great objection. In fact, a new process altogether is much needed. Groves (Pharm. Journ. vol. xvii. p. 510) has suggested the employment of red phosphorus. Neustadt (Chem. News, vol. iv. p. 13) proposes to make the medicinal acid by decomposing phosphate of baryta by sulphuric acid; and Proctor (Pharm. Journ. vol. i. 2nd ser. p. 9) thinks it should be made by diluting the glacial acid; indeed, it is stated (Lancet, 1864, vol. i. p. 361) that it is so made from glacial acid imported from Germany, but that such an acid will not do for making *Syrupus Ferri Phosphatis*. Probably, however, if the acid were boiled or kept in solution for some time, so as to convert the mono- into ter-hydrated or common phosphoric acid (Maisch, Pharm. Journ. 2nd ser. vol. iii. p. 278), there would be no objection to its use in making the iron syrup. A Member of this Society is, however, working out the subject (Pharm. Journ. vol. v. p. 491), so that we may hope soon to hear something satisfactory concerning it.

ACIDUM SULPHURICUM.—To effect the purification of commercial sulphuric acid we are ordered to distil it; an operation somewhat troublesome, but which can be accomplished if strips of platinum or quartzite (Pharm. Journ. vol. vii. p. 232) be put into the retort, and the latter be heated by the flame of a ring gas-burner in such a manner that the heat only impinges against the sides of the retort, unpleasant *soubresauts* being thus avoided. Distillation will certainly enable us to get rid of one of the three chief impurities,—lead. It is next assumed in the Pharmacopœia that nitrous compounds are always present in commercial sulphuric acid, and to eliminate them we are to adopt Pelouze's proposition (Pharm. Journ. vol. xiii. p. 41) of distillation with sulphate of ammonia, which, re-acting on them, gives, apparently, water and nitrogen, the latter escaping as gas. Now nitrous compounds are *not* always present in commercial sulphuric acid, and therefore the absence in the Pharmacopœia of any directions as to testing the specimen before distillation entails the trouble of a difficult and, to some extent, dangerous operation where it may not be necessary; for in all Pharmaco-

pœia operations with sulphuric acid, lead is got rid of by mere dilution. The operation, however, it must be admitted, has this advantage, that arsenic, the third chief impurity in commercial sulphuric acid, *may* also be thereby removed. Since the Pharmacopœia was printed, some researches by Bussy and Buignet (Journ. de Pharm. et de Chim. vol. xliv. p. 177, and Chem. News, vol. ix. p. 73) on the purification of arseniferous sulphuric acid have been published, from which it appears that,—first, when arsenic is present as arsen*ic* acid ($As\ O_5$), it invariably remains behind in the retort when the sulphuric acid is distilled; second, that when present as arsen*ious* acid ($As\ O_3$), it invariably accompanies the rectified sulphuric acid; and third, that the addition of a little nitric acid to, or its presence in, sulphuric acid ensures the oxidation of arsenious and arsenic acid. So, then, in the examination of sulphuric acid with a view to purification, the course to be adopted seems to be as follows:—Test for arsenic by the hydrogen test, and for nitrous compounds by adding a small quantity of powdered sulphate of iron, which acquires a violet tint if they are present. If both or only nitrous compounds are found, then add sulphate of ammonia, and distil. If nitrous compounds are absent and arsenic is present, first heat with a little nitric acid, and then add sulphate of ammonia, and distil. If both are absent, distillation is scarcely necessary. As the process stands at present, lead *will* be eliminated, nitrous compounds will be got rid of, *if present*, and arsenic may or may not be removed from the acid.

ACIDUM SULPHURICUM DILUTUM.—Is slightly stronger than the Dublin; slighter, weaker than the Edinburgh; and about one and a half per cent. weaker than the old London acid.

ACIDUM SULPHUROSUM.—In directing "sulphuric acid" to be used in the preparation of sulphurous acid, the words "of commerce" have obviously been omitted, the use of the distilled acid being even less necessary here than in the preparation of *Sodæ Phosphas*, where "Sulphuric Acid of commerce" is ordered to be employed. [The words are also omitted from the smaller edition of the Pharmacopœia.]

ACIDUM TANNICUM.—Neither the London nor Edinburgh Pharmacopœias gave a process for obtaining tannic acid; that now given is from the Dublin work, and is, in fact, Pelouze's process of percolating galls with ether. It is important that the officinal ether, that containing eight per cent. by volume of alcohol, be used; for Sandrock has shown (Pharm. Journ. vol. xii. p. 597) that neither pure ether nor pure washed ether gives satisfactory results, but the process is rapid and successful if the ether contains one part of alcohol to every sixteen of ether. It may be interesting to state here, that with regard to the lower of the two layers of liquid obtained in the receiver of the percolator in the process, Bolley has shown (Chem. News, vol. ii. p. 270) that it is not, as Pelouze had said, a concentrated aqueous solution of tannic acid, nor, as Möhr had said, a concentrated solution of tannic acid in ether, but a solution in equal volumes of ether and water. This quite accords with the previous observation of Luboldt (Journ. für Prak. Chem. vol. lxvii. p. 357), that the lowest of the three layers of liquid obtained on treating tannin with ether and water is a hydrate of tannic acid dissolved in etherated water.

ACONITIA.—A process somewhat similar to the new one given for the preparation of aconitia in the Pharmacopœia is described by Liégeois and Hottot (Journ. de Pharm., Aug. 1863). This French process was afterwards, however, stated to be of English origin (Chem. News, vol. viii. p. 200),—a statement that quite accords with that of Garrod, from which (Med. Times and Gaz. 1864, vol. i. p. 359) it may be inferred that the Pharmacopœia process was supplied by some English Pharmaceutists who make aconitia largely. The process seems to be excellent, for one-thirtieth of a grain of the alkaloid prepared by Liégeois and Hottot killed a frog in four minutes, while a grain and a half of the most active

aconitia that could be found in commerce was required to be given to another frog before the same effect was produced.

Adeps Præparatus is ordered to be obtained from "perfectly fresh" hog's fat, liquefied over a boiling-water bath, strained through fine linen, and again similarly heated until entirely free from water. According to Hills (Pharm. Journ. 2nd ser. vol. i. p. 399) and Haselden (Pharm. Journ. 2nd ser. vol. v. p. 252) this treatment appears to be insufficient, and that to obtain pure lard it is necessary to wash the flare with water; while, on the other hand, Squire (Pharm. Journ. 2nd ser. vol. v. p. 253) and Ince (*ibid.* p. 264) regard heat as alone necessary. The subject obviously needs further investigation; at least, it is desirable that before the issue of another Pharmacopœia, the published experience of Pharmaceutists shall have settled the question one way or the other.

Ammoniæ Benzoas.—By following the Pharmacopœia directions for preparing this salt, a bibenzoate instead of a benzoate of ammonia will be obtained. After evaporating the solution of benzoic acid in ammonia to the crystallizing-point, some more ammonia should be added, and then a neutral salt is obtained. This method of obviating the formation of an acid salt was proposed by Fehling (Pharm. Journ. vol. iv. p. 184), and ought to have been included in the Pharmacopœia process. That a bibenzoate will be formed if this precaution be not adopted, was long ago pointed out by Berzelius and confirmed by Maisch (Amer. Journ. Pharm., and Chem. News, vol. iii. p. 259).

Antimonium Sulphuratum.—The basis of this preparation is "prepared" sulphuret of antimony. On turning to appendix A., "prepared" sulphuret is found to be "tersulphuret of antimony reduced to fine powder;" it should therefore have been termed *powdered* sulphuret of antimony, the word "prepared" being unnecessary, and, conventionally, wrong. One would have expected "prepared" sulphuret of antimony to be sulphuret of antimony from which its common impurity, sulphide of arsenic, had been separated. This might readily have been done by directing the powdered sulphuret to be digested in solution of ammonia for forty-eight hours,—a proceeding which Weigand tells us (Gmelin's Chemistry, Eng. trans. vol. iv. p. 337) removes the sulphide of arsenic almost completely. It might then have been termed "prepared" sulphuret of antimony. But the term "sulphuret" is also objectionable. In the old long-unused words, hydruret, nitruret, chloruret, bromuret, ioduret, etc., the syllable *uret* has been almost universally replaced by that of *ide*; and in the Pharmacopœia, as in other modern works, we find the synonymous and more euphonious words chloride, bromide, iodide, etc. Why did not the authors also follow the example of other modern authors in employing the word sulphide instead of sulphuret? Medical and Pharmaceutical students, who in these days have to learn so much, very naturally complain of the great loss of time involved in the "getting up" of such differences of nomenclature.

Aquæ.—It is gratifying to find that in the new formulæ for the preparation of waters, the compilers of the British Pharmacopœia have recognized the improvements suggested in the published papers of such Pharmaceutists as Deane, Haselden, Ince, Pereira, Phillips, Warington, and Whipple. Only in one, that of *Aqua Rosæ*, has any general recommendation been neglected: here *fresh* rose petals are directed to be distilled with water. Now *fresh* flowers can only be obtained at one season of the year: the consequence is, that if the water be prepared with *fresh* petals, a quantity must be distilled which will last through many months. Under these circumstances, the water frequently becomes sour and mucilaginous. Moreover, when made from flowers which have been "pickled" by the addition of three times their weight of common salt, rose water remains clear and fragrant for a much longer time than when made from the fresh flowers. All this was stated by Haselden in a paper read at a Pharmaceutical meeting in June, 1856, and his statement was confirmed by Deane, Gibbs, and

others who took part in the discussion (Pharm. Journ. vol. xvi. p. 15). It is to be hoped, therefore, that the word *fresh* will be omitted from the formula in a future edition.

BISMUTHUM ALBUM is the Edinburgh name for the London *Bismuthi Nitras* and the Dublin *Bismuthi Subnitras*. Etymologically, the term *white bismuth* is equally applicable to the carbonate, oxychloride, and nitrate of bismuth all three of which are found in commerce. On the other hand, the name *bismuthi nitras* can only refer to one, the officinal one, of these three white powders, and as it is a name which need not alter with any new views of the atomic constitution of the salt, is the one which had most claims to retention.

CALOMELAS.—See HYDRARGYRI CHLORIDUM.

CHLOROFORMUM.—The process given for the preparation of chloroform is from the Dublin Pharmacopœia, with two important improvements in the details of purification. First, the washed, but still impure chloroform is to be agitated with sulphuric acid for *five minutes* only; and, second, after agitation it is to be rectified from chloride of calcium and *slaked lime*. Now Dr. Christison has shown (Pharm. Journ. vol. x. p. 253) that chloroform, if left in contact with ordinary sulphuric acid, which contains, as it generally does, an impregnation of nitrous acid, will, in less than twenty-four hours, undergo decomposition and afterwards rapidly evolve chlorine; and that even with pure acid prolonged contact sets up a similar change. Hence the importance of restricting the period during which the chloroform is to be shaken with the acid, and hence the expediency of redistilling from lime as well as chloride of calcium, inasmuch as any trace of acid is thereby neutralized and retained in the retort. In the tests of the purity of chloroform we have another indication that scientific researches on this substance have been consulted. Pure chloroform "evolves no gas when potassium is dropped into it." This is Hardy's application (Répert. de Chem. and Chem. News, vol. v. p. 286) of Heintz's observation that chloroform is not attacked by the metals of the alkalies even at the boiling-point. If the chloroform contain alcohol of any kind, or other substances susceptible of alteration by potassium or sodium, a disengagement of hydrogen or light carburetted hydrogen and carbonic oxide takes place.

COLLODIUM.—In explanation of the circumstance, pointed out by Dr. Redwood in the first of these lectures, that the process given in the new Pharmacopœia for the preparation of the pyroxylin, of which collodium is a solution, yields a perfectly insoluble article, it transpires that the formula was allowed to be inserted just as received from its author, no allowance being made for the alteration in the strength of its nitric acid. We may, of course, expect that this omission will be rectified in a future edition. [It has not been corrected in the smaller edition recently issued.]

DECOCTA.—The remarks of Proctor (Pharm. Journ. 2nd ser. vol. i. p. 10) that, in the decoctions, greater uniformity would be obtained by making both the time of boiling and the quantity to be ultimately produced definite, seem to have been acted on, though *Decoctum Quercus* and *Decoctum Hordei* are still exceptions to what otherwise is the rule. Not so another remark of the same pharmaceutist, that "*Decoctum Aloes Compositum* would probably be in no respect injured by the omission of saffron, a costly and nauseous stimulant of questionable efficacy." In *Decoctum Sarsæ* and *Decoctum Sarsæ Compositum*, the sarsaparilla is directed to be "not split." Bell (Pharm. Journ. vol. i. p. 55) pointed out the inutility of the protracted bruising and infusing and simmering of the root ordered in a previous Pharmacopœia, and was confirmed by Whipple (Pharm. Journ. vol. xiii. p. 641). These suggestions seem to have been adopted; it is due however to the compilers of the last Dublin Pharmacopœia to state that several of the improvements in the decoctions are only so in comparison with the old London and Edinburgh Pharmacopœias, the Dublin work of 1850 having

largely profited by the published observations of practical Pharmaceutists. In *Decoctum Taraxaci*, the difficulty or impossibility of having fresh roots always ready, as taken for granted by the London and Edinburgh Pharmacopœias, is met by ordering the "dried" root to be used. This alteration was also suggested by Proctor (Pharm. Journ. 2nd ser. vol. i. p. 10). [Professor Bentley has noticed that *Decoctum Ulmi*, though alluded to under *Ulmus* in the Materia Medica of the Pharmacopœia, has been omitted from the Preparations. In the small edition just published, not only is Decoctum Ulmi omitted from the Preparations, but in the Materia Medica also it is "conspicuous by its absence."]

Digitalinum.—In addition to Professor Bentley's allusion (Pharm. Journ. vol. v. p. 481) to the overlooked researches of Homolle and Quevenne on this principle, attention may be drawn to those of Mayer, Englehardt, Rochleder, and others (Chem. News, vol. viii. pp. 64 and 76), from which it would seem that the *Digitalis purpurea* mainly owes its value to a *volatile* alkaloid, and that digitalin itself is suspected to be identical with, or have a close relation to, several non-nitrogenous proximate principles characteristic of the Scrophulariaceous plants. As a source of Digitalin, Buchner (Pharm. Journ. vol. xi. p. 419) says that the seeds are preferable to the leaves of the foxglove, the efficacy of the leaves depending (Vogt., Pharm. Journ. vol. xi. p. 523) on the season when they are gathered. Altogether the subject is one much needing investigation. It is satisfactory to see that the Royal Academy of Medicine of Belgium has recently offered a prize medal of 500 francs for an essay on Digitalin, including its clinical history, composition, distinctive characters, and a process of extraction which shall give a constant and definite product. The competition is to close on April 1st, 1865.

Emplastra.—Haselden's suggestion (Pharm. Journ. 2nd ser. vol. i. p. 546) and the directions of the Edinburgh and Dublin Colleges to include Resin in the formula for *Emplastrum Belladonnæ* have been adopted; at the same time the London strength, which was double that of the other colleges, is retained. This compromise will probably result in the production of an adhesive and efficacious plaster.

The process for *Emplastrum Calefaciens* is new. The Cantharides is to be exhausted by infusion in boiling water, which, according to Beaupoil, Robiquet, Proctor, and others (Pharm. Journ. vol. xii. p. 291), perfectly extracts the active matter. The resulting plaster will possibly take the place of the Irish *Emplastrum Calefaciens*, which was a simpler preparation, and the Scotch *Emplastrum Cantharidis Compositum;* it contains, however, no Burgundy Pitch. The last two English Pharmacopœias have not had any corresponding *Warm Plaster*.

Emplastrum Cantharidis. In preparing this plaster, wax, suet, and lard are to be melted together, then mixed with melted resin, and after removing the source of heat and before the mixture solidifies, cantharides in fine powder are to be sprinkled in, the whole being briskly stirred. Now Müller, so long ago as 1841, has shown (Pharm. Journ. vol. i. p. 502) that the uncertainty which sometimes attends the effects of blistering plaster, as usually prepared, may be ascribed to the circumstance of the vesicating principle remaining locked up in the tissues of the fly. In order to obtain a plaster more uniform in its operation, Müller recommended that the cantharides be left to digest in the plaster kept fluid at a moderate heat for five or six hours. Soubeiran (*ibid.*) considered Müller's suggestion a very good one, corresponding with what Guibourt had said on the same subject. At about the same date Donovan demonstrated the superior efficacy of the plaster when the cantharides had been digested in the fats at an elevated temperature. Ince too (Pharm. Journ. vol. ii. p. 391), though citing a case in which Donovan's instructions, strictly followed, resulted in serious injury to the face of the operator from the volatilizing of the cantharidin, stated that a

longer digestion at a lower temperature would do as well. In confirmation of the deduction from these experiments that a moderately high temperature does not injure the active principle of cantharides, but that its natural volatility is retarded by dissemination through fatty matters, and only accelerated when escaping vapour of water, etc., carries it away, Southall states (Pharm. Journ. vol. ii. p. 655) that on evaporating an *infusion* of cantharides, he was attacked by inflammation of the eyes so severely as to be confined at home for two or three days; and that, subsequently, he was still more severely affected on stirring soft plaster into some wax that had been melted over a naked fire. Finally, Proctor, of Philadelphia, in an elaborate paper on the volatility and solubility of cantharidin (Amer. Journ. Pharm. 1862, and Pharm. Journ. vol. xii. p. 291) says, "When powdered flies are stirred into the ordinary vehicle of resin, wax, and lard, so as to chill it almost immediately, but little of the cantharidin is dissolved by the fatty matter, and when applied to the skin the process of vesication is retarded. If, however, the cerate be kept fluid for a length of time, say for half an hour, by a water-bath or other regular heat, no loss of cantharidin occurs by the heat, the active principle is in great measure dissolved by the fat, and every part is impregnated and active." In face of these researches we are told to do exactly what they indicate should not be done. We can only suppose that in this matter the authors of the British Pharmacopœia have committed the grave error of not searching any pharmaceutical or chemical journals for papers on this subject since the last three Pharmacopœias were published.

Emplastrum Opii. This is a very different plaster to that of the last London Pharmacopœia, but somewhat resembles the Edinburgh form. It is the Dublin process, and contains in the place of the extract of opium of the London College powdered opium, as was suggested for the London Pharmacopœia by Southall (Pharm. Journ. 2nd ser. vol. i. p. 11); and, in place of frankincense, resin, as suggested for the London form by Haselden (Pharm. Journ. 2nd ser. vol. i. p. 545).

EXTRACTA.—I feel strongly inclined to pass over the subject of medicinal extracts, for I must confess I scarcely know where the stand-point should be from which to examine the processes given for their preparation in the British or any other Pharmacopœia. Some are concentrated juices, others concentrated infusions, others concentrated decoctions, others concentrated tinctures of plants, of whose general constituents little or nothing, and of whose special constituents still less, may be known. Excepting any changes that may be effected during evaporation, they may therefore, from a therapeutical and chemical point of view, be classed with juices, infusions, decoctions, and tinctures; their only distinctive value being that they offer to the medical practitioner a means by which either of those four classes of preparations can be given in a solid, that is, a pilular, form. If this be their true position as remedial agents, they, unlike other galenical compounds, need only to be considered from a purely physical point of view. And, so far as I have observed, those published investigations and suggestions of pharmaceutists which have had reference to improvements in the consistence, persistence, and other physical conditions of extracts, seem in several instances in the British Pharmacopœia to have been attended to.

The extracts of *Aconite*, *Belladonna*, *Hemlock*, and *Henbane*, still will contain any starchy matter pressed out with the juice of the fresh leaves and young branches of the plants. So far these extracts will resemble those of the London Pharmacopœia, but to exactly the same extent will differ from those of the Edinburgh and Dublin Pharmacopœias, both of which ordered that amylaceous matter should be rejected either by filtration or subsidence. It is to be hoped, therefore, that in the course of a year or so Scotch and Irish pharmaceutists will publish their experience of the extent to which this retention of starch has affected the physical qualities of the extracts they have been in the habit of dispensing. These extracts, as well as those of *Colchicum*, *Liquorice*, and *Taraxacum*,

will also be free from vegetable albumen,—a substance to whose presence, according to Chevallier, confirmed by Scanlan (Pharm. Journ. vol. i. p. 133, and vol. iv. p. 72), the formation of mould on extracts is to be ascribed. Such extracts will, according to Scanlan, be about fifteen per cent. stronger than if the vegetable albumen were present.

The remarks made last month by Dr. Redwood concerning the semi-exhaustion of cinchona bark, of its active principle quinine, in the process for making Decoctum Cinchonæ are equally applicable in the case of *Extractum Cinchonæ Flavæ Liquidum.* Garrod admits (Med. Times and Gaz., 1864, vol. i. p. 360) that the process given for its preparation is quite unable to effect the exhaustion of the bark of its alkaloids. So long as quinine itself can as readily be prescribed as it is at the present day, it is difficult to understand what peculiar value such a decoction and liquor can possess.

In *Extractum Colchici Aceticum*, the starch of the colchicum juice is rejected from the extract, as suggested by Southall (Pharm. Journ. vol. xiii. p. 62). In this extract, as first made by Garden, under the direction of Sir Charles Scudamore (Pharm. Journ. vol. vii. p. 260), the starch was also rejected; but, according to Fordred (*ibid.* p. 389), the resulting mass was deliquescent, and required the admixture of starch when dispensed. The last Dublin Pharmacopœia also ordered the starch to be excluded, the Edinburgh and London Colleges requiring it to be retained. In using the new extract therefore, dispensers will have an opportunity of deciding this moot point in pharmaceutic art, and it is to be hoped they will publish the result of their practical observations.

Extractum Colocynthidis Compositum is an old friend in its old place, having been erroneously, according to Bell (Pharm. Journ. vol. xviii. p. 457) and other Pharmaceutists, called a pill for more than twenty years. Hard soap replaces soft in the formula, a little practical improvement suggested by Whipple (Pharm. Journ. vol. xiv. p. 344).

Extractum Ergotæ Liquidum. The oily matter existing in ergot was formerly supposed to be the matter on which its activity depends; hence the ethereal tincture of ergot of the last London Pharmacopœia, a mere solution of the oil. Bonjean, however (Pharm. Journ. vol. iii. p. 129), showed that ergot contained two active substances; the one, ergotin, acting on the arterial integuments, and a poisonous oil and resin acting on the nervous centres; and he suggested percolation of the ergot with ether to remove the oil. These researches and suggestions have been acted on in the British Pharmacopœia; the extract is prepared so as to exclude the oil and include the ergotin, and the ethereal tincture has been quite omitted. We still, however, know little of this so-called ergotin; but it is now being investigated (Pharm. Journ. 2nd ser. vol. v. p. 492), and we shall probably soon be better acquainted with its nature and properties.

Extractum Filicis Liquidum is the old *oil of male fern.*

Extractum Jalapæ is admitted (Garrod, Med. Times and Gaz. 1864, vol. i. p. 360) to be simply jalap resin *plus* a natural excipient. Surely Pharmaceutists will be able to tell the authors of the next British Pharmacopœia how jalap resin can be made into pills by the aid of artificial excipients, and the list of extracts be thus relieved of an unnecessary member.

Extractum Lupuli will be found to be a different preparation to the old extract of hops. Pharmacologists actually engaged in practising pharmacy will probably report on this and other new processes after they have had time to test their value.

Extractum Nucis Vomicæ. Better directions than those given under this head for exhausting the nux vomica seeds will be found under the article Strychnia, page 328 of the British Pharmacopœia.

Extractum Sarsæ Liquidum. This is an evaporated infusion, the sarsaparilla not being, however, so well exhausted as perhaps it might be; for Husband has

shown (Pharm. Journ. vol. iii. p. 250) from many experiments that cold or warm water is inadequate to extract all the virtues from sarsaparilla, and recommended diluted alcohol for that purpose. In effect, he suggested that the extract should be a concentrated tincture instead of a concentrated infusion; and a committee on his paper, while stating that cold water in a considerable degree extracted the virtues from sarsaparilla, yet agreed that diluted alcohol was a more eligible menstruum.

Extractum Stramonii. This is an evaporated tincture. Practical men (Whipple, Pharm. Journ. vol. xiv. p. 345) say that the production of such an extract is a tedious operation, on account of the large quantity of oil the stramonium seeds contain, and recommend pressure of the seeds before percolation with proof spirit. Confirmation of this statement would probably result in an easier process being introduced into a future Pharmacopœia.

Extractum Taraxaci. This is essentially Hill's process (Pharm. Journ. 2nd ser. vol. i. p. 401).

FERRI CARBONAS SACCHARATA.—The process for the preparation of this substance now includes two or three little practical details, having for their object the preservation of the iron in the state of protosalt. That of using *boiling* distilled water, which contains less air dissolved in it than in cold, and which therefore obviates some oxidation that would otherwise take place, was first suggested by Phillips (Pharm. Journ. vol. iii. p. 577), and was adopted in the last London Pharmacopœia. That of placing the mixed hot solutions of sulphate of iron and carbonate of soda in an accurately covered deep vessel, in order to exclude air as far as possible, was suggested by Bastick (Pharm. Journ. vol. x. p. 541) soon after the last Pharmacopœia was published

FERRI ET QUINÆ CITRAS.—This preparation is now very properly made an officinal article. It is prepared from the magnetic oxide of iron, by a process which, according to Garrod (Med. Times and Gaz. 1864, vol. i. p. 359), was supplied by some eminent makers of that salt. It has been stated, however, that the process does not yield scales of the usual colour. Probably some detail of manufacture has been omitted, for Braithwaite found (Pharm. Journ. 2nd ser. vol. i. 409) that recently precipitated and moist magnetic oxide of iron yielded a citrate which possessed the peculiar colour, except that it was slightly darker; he also found that the addition of a small quantity of potash to the solution of the percitrate produced the desired effect, and was, he believed, the method generally adopted. In the accompanying directions for the preparation of the quinine necessary to the formation of the double citrate, ammonia is directed to be added to a solution of the hydrochlorate of quinine, and the precipitated quinine to be washed until the washings give no sensible precipitate on the addition of *chloride of barium.* This obviously must be a slip of the pen, and doubtless, as suggested by the 'Lancet,' *nitrate of silver* intended, for there is nothing to be washed away that could give a precipitate with chloride of barium, whereas the chloride of ammonium formed would of course give a white precipitate of chloride of silver, on the addition of nitrate of silver, so long as any remained unremoved by the wash-water. [This error is corrected in the smaller edition of the Pharmacopœia recently published.]

FERRI PERCHLORIDUM.—See *Liquor Ferri Perchloridi.*

FERRI PEROXIDUM, Fe_2O_3,HO, and FERRI PEROXIDUM HYDRATUM, $2\,Fe_2O_3,3\,HO$.—There is inexcusable bungling in the chemical names and formulæ of these compounds. The name *Ferri Peroxidum*, as well as the process for making it, seems to be taken from the Dublin Pharmacopœia, except that the precipitated peroxide is to be exposed to a heat of 212° instead of an obscure red-heat. The name was quite applicable to the Dublin peroxide, for at an obscure red-heat hydrated peroxide of iron loses all its water; but it is not applicable to oxide prepared according to the process of the British Pharmacopœia, for at a

temperature of 212°, hydrated peroxide of iron retains one equivalent of water, and is a definite protohydrate, Fe_2O_3, HO. The chemical formula given under *Ferri Peroxidum* is quite right, but the name should be Ferri Peroxidum *Hydratum*. As it now stands, the name expresses one thing and the formula another.

In the case of *Ferri Peroxidum Hydratum*, neither the name nor the formula are sufficiently explicit. The substance really is a *moist* hydrated peroxide of iron, and its formula, so long as it accords with the condition of being "recently made," is $Fe_2O_3, 3HO$. It is a *ter*hydrated peroxide, not *sesqui*hydrated, as the Pharmacopœia formula indicates. In fact, only when the terhydrate has been long kept under water, and has become crystalline and almost valueless for the chief purpose for which it is inserted in the Pharmacopœia, namely, as an antidote to arsenic,—it is only then that the preparation has the formula assigned to it in the Materia Medica. Its Latin name should be Ferri Peroxidum Hydratum *Humidum*.

Ferri Sulphas Granulata.—This preparation and process is from the Dublin Pharmacopœia, except that the desiccation of the granules in an atmosphere rendered dry by the presence of sulphuric acid is now omitted. A strong and recently prepared hot solution of sulphate of iron is filtered into a jar containing spirit of wine, the spirit being rapidly stirred meanwhile. The result is the formation of minute or granular crystals which are said to oxidize less readily than the ordinary crystals deposited by the slow quiet cooling of their aqueous solution. It is assumed in the Pharmacopœia that the spirit simply acts mechanically, for the same chemical formula is given for this as for the ordinary sulphate, namely, $FeO, SO_3 + 7 HO$. This is probably an error, for although Berthemot (Journ. de Pharm. vol. xxv. p. 206) once stated that the crystals under these circumstances retain their full amount of water of crystallization, Gmelin (Cav. Soc. Trans. vol. v. p. 240) asserts that alcohol causes the precipitation of a white "partly dehydrated" salt; and again, Bonsdorf (*ibid.*) shows that alcohol withdraws water from sulphate of iron and causes the crystals to turn white. Four specimens of granulated sulphate of iron prepared for me in the laboratory of this Institution by Mr. P. W. Squire, and analysed by another student, Mr. Herbert Smith, yielded an amount of water more nearly corresponding with a sulphate having six instead of seven equivalents of water of crystallization, but the amount seems to be variable.

Selmi, Geiseler, Bonsdorf, Abich, Boudet, and Poma, have all tried to preserve sulphate of iron, but have failed more or less. Ruspiné (Pharm. Journ. vol. x. p. 308) dried the ordinary crystals at 86° Fahr. in a closet, when they soon effloresced, then powdered and placed them in well-stoppered bottles. He stated that they might be kept for any length of time. It would seem that crystals of sulphate of iron contain water not in a state of combination, but simply resting between the plates of the crystals, and that this water carries oxygen from the external air to the interior of the crystals; in this way the crystals or masses of crystals become oxidized. If this mechanically adherent water be got rid of, or, as in the Pharmacopœia process, be prevented from accumulating, then the crystals do not oxidize quite so readily.

Ferrum Redactum.—The test, or rather method of analysis given for this substance in the Materia Medica is that proposed by Draper (Chem. News, vol. i. p. 114).

Ferrum Tartaratum.—The proportions of oxide of iron and acid tartrate of potash here ordered are somewhat different from those previously recommended; they are those shown by Bastick (Pharm. Journ. vol. x. p. 444) as the best, giving the potassio-tartrate of iron, or tartarated iron as it is now termed, the constitution ($KO, Fe_2O_3, \overline{T}$) which Soubeiran and Capitaine had previously indicated it to possess. The percentage of oxide of iron also it is, in the Materia Medica,

stated to contain, namely, 29·84, is quite in accordance with the experiments of Bastick, who showed that the preparation could not contain more than about 30 per cent. instead of 34 per cent. as stated in the London Pharmacopœia.

HYDRARGYRI CHLORIDUM.—What is *Hydrargyri Chloridum?* According to the old Pharmacopœias it was calomel, according to the new Pharmacopœia it is corrosive sublimate. Now it is not my intention to say anything against the employment of the terms calomel, corrosive sublimate, red iodide of mercury, green iodide of mercury, red oxide of mercury, and ammoniated mercury; every prescriber and dispenser knows what is meant by them, and perspicuity should be the primary consideration in pharmacopœial nomenclature. Nor have I any remarks to make on the processes for the preparation of these substances. But the adoption in the British Pharmacopœia of new views of the atomic constitution of mercury and its salts, and the thrusting of those views on prescriber and dispenser without previously consulting or warning them, is, in my opinion, a proceeding uncalled-for, inexpedient, and dangerous. For will not the physician who objects, or is unaccustomed to use the terms Calomelas and Hydrargyri Corrosivum Sublimatum, continue to use the term Hydrargyri Chloridum, or its contraction, Hyd. Chlor.? Assuredly he will, and the consequence will be endless anxiety and trouble to the druggist, and possible salivation, or even death, to the patient.

But this proceeding is one which, so far from indicating a desire in the compilers of the work to keep pace with the progress of science, exhibits that disregard of recent researches which is so frequently evident in the book. On the 19th of November, 1863, two months before the Pharmacopœia was published, Dr. Frankland read a paper before the Chemical Society on a new method of producing certain new mercury compounds, from which, among other important results, it was obvious that the question regarding the atomic constitution of mercury salts might be considered to be settled; settled, moreover, in accordance with the constitution ascribed to these salts in the last London, Edinburgh, and Dublin Pharmacopœias. This paper gave rise to some interesting discussion, in the course of which the President, Professor Williamson, said that by the light of these researches the constitution of corrosive sublimate could not be viewed otherwise than as the bichloride of that metal. The discussion and an abstract of the paper were published, on the 28th of November, in the 'Chemical News' (p. 262), and shortly afterwards in the Chemical Society's own Journal (1863, p. 415). There was thus ample time for the authors of the Pharmacopœia to detect and reject their new and erroneous views, had they desired to do so.

If names other than, or rather in addition to, those of calomel and corrosive sublimate were desired for the two chlorides of mercury, to meet the wishes of medical practitioners who think it objectionable in the interests of their patients to use those names, or who may occasionally find it absolutely necessary to keep from their patients the knowledge of the fact that they are taking calomel or corrosive sublimate, such additional names could very well be found; names that are in constant use by scientific men of all countries, names which correctly and shortly express difference of composition, but which are perfectly independent of the constitution of the salts they are used to designate.

HYDRARGYRUM CUM CRETA is still retained in the Pharmacopœia, although it has been repeatedly shown to be most uncertain in its action, and the cause to be the varying amounts of black oxide or red oxide of mercury inevitably present in it.

INFUSA.—The most noticeable point in connection with the infusions in the new Pharmacopæia is the short time during which the ingredients are to be kept in contact with the water, as compared with the periods of maceration ordered in the last London, Edinburgh, and Dublin Pharmacopœias. The following Table shows these differences at a glance:—

Infusum.	Duration of Infusion in Hours.			
	London.	Edinburgh.	Dublin.	British.
Anthemidis	1/6	1/3	1/4	1/4
Aurantii	1/4	1/4	1/2	1/4
Bucco	4	2	1	1
Calumbæ	2	percolate	2	1
Caryophylli	2	2	1	1/2
Cascarillæ	2	2	1	1
Catechu	1	2	1/2	1/2
Chiratæ		2	1	1/2
Cinchonæ Flavæ	2	4		2
Cuspariæ	2	2		2
Cusso				1/4
Digitalis	4	4	1	1
Dulcamaræ				1
Ergotæ			1	1/2
Gentianæ Co.	1	12	1	4
Krameriæ	4		1	1
Lini	4	4		4
Lupuli	4			2
Maticæ			1	1/2
Quassiæ	2	2	1	1/2
Rhei	2	12	1	1
Rosæ Acidum	2	1	1	1/2
Senegæ		4	1	1
Sennæ	1	1	1	1
Serpentariæ	4	4		2
Uvæ-Ursi				2
Valerianæ	1/2		1	1

Infusum Calumbæ would be a more satisfactory preparation if after infusion of the bruised root in cold water, the strained product were heated to the boiling-point to coagulate vegetable albumen. This procedure was recommended by Squire and by Greenish (Pharm. Journ. vol. v. p. 307). *Cinchona* is the only drug of which there is both an infusion and decoction. The decoction is not much stronger than the infusion, and neither contains the whole of the active matter of the amount of bark used in their preparation. I would again say that while quinine can be readily prescribed, it is difficult to understand what peculiar value attaches to these Galenical preparations of cinchona bark.

LINIMENTA.—*Linimentum Cantharidis* is a modified form of the old *Acetum Cantharidis*, ether as well as acetic acid being used as a solvent for the vesicating principle of the cantharides. Redwood (Pharm. Journ. vol. i. pp. 134 and 353) has shown that acetic acid is not a proper vehicle for the active matter of the flies, and Proctor (Pharm. Journ. vol. xii. p. 291) also states that *cold* acetic acid is an inefficient solvent of cantharidin. Ether, however, does dissolve it, though more easily when hot than cold. The Dublin liniment, now omitted, was, chemically, a model preparation of cantharides, for it was made by digesting the flies in olive oil for three hours in a steam or water-bath,—a mode of treatment which we know (see *ante*, *Emplastrum Cantharidis*) perfectly extracts the active matter. But, according to Squire (Three Pharms. p. 78), the resulting liniment was not a favourite, and so, probably, there is some medical objection to it; otherwise we should have expected that liniment to be the Linimenum Cantharidis of the British Pharmacopœia.

Mr. Hemingway has pointed out to me an omission in the formula of Linimentum Cantharidis. Eight ounces of powdered cantharides are to be macerated in four fluid ounces of acetic acid for twenty-four hours, and then percolated with a pint of ether, till twenty fluid ounces of liniment are obtained. Now Mr. Hemingway has found that, owing to the retention of liquid in the percolator by the large bulk of cantharides ordered, only fifteen fluid ounces of liniment are obtained. Nothing is said about pressing the marc as directed in the preparation of tinctures. Nor will pharmaceutists be likely to adopt this mode of making up the pint of liniment. For although Mr. Hemingway thus obtained an additional two and a half ounces of liquid, he did so at the expense of a blistered face, owing to the evaporation of the cantharidin along with the vapour of ether during manipulation. He was, moreover, still two and a half ounces short of his pint of liniment. The authors of the Pharmacopœia would probably, under these circumstances, direct that "Ether, one pint, *or a sufficiency*," be used, so that the percolation, or displacement, be continued until the product measures twenty fluid ounces.

Linimentum Hydrargyri is now made by the Dublin process, in which mercurial ointment is to be dissolved in camphor liniment "with a gentle heat." Deane pointed out (Pharm. Journ. vol. xviii. p. 310) the omission in the London process of directions to apply "a gentle heat" (Boucher also, Pharm. Journ. 2nd ser. vol. i. p. 15); otherwise, the only difference between the London and Dublin liniments is that the latter contains oil in the place of the lard of the former. This difference can scarcely account for the fact, that of the specimens of this liniment shown at the International Exhibition, that by the Dublin process soon spoiled, while the London preparation is unchanged to the present time (Pharm. Journ. 2nd ser. vol. v. p. 476). It remains for some pharmaceutist to ascertain by experiment if such a result is constant or only accidental, in order that in a future edition of the Pharmacopœia the present formula may be retained, or substituted by the London one, or exchanged for a slightly modified one.

Linimentum Saponis is essentially that of the London Pharmacopœia. Deane (Pharm. Journ. vol. xviii. p. 462) stated it to be the best, provided a note be added to the effect that maceration of the ingredients should take place at a temperature not exceeding 70°; and this is exactly the addition to the old process.

LIQUORES.—*Liquor Antimonii Terchloridi* is misplaced here. Being an article employed in a chemical process, but not itself used in medical practice, it should, according to the rule laid down in the Preface of the British Pharmacopœia (p. xi), have been placed in Appendix A., and not among the Preparations and Compounds.

Liquor Arsenicalis. This is the Edinburgh and Dublin name for the London *Liquor Potassæ Arsenitis.* Bell showed (Pharm. Journ. vol. xviii. p. 489) how objectionable the latter name was, especially in its contractions, and advocated a return to the old one now adopted.

Liquor Arsenici Chloridi of the London is omitted from the British Pharmacopœia. This is satisfactory, both pharmaceutically and therapeutically, for the name was wrong, and the solution itself merely a second arsenical one, and therefore superfluous. These objections to it were urged by Hanbury and Garrod (Pharm. Journ. vol. xvi. p. 542).

Liquor Calcis Saccharatus is a solution of lime about twelve times the strength of lime-water. According to Peligot's table of the composition of solutions of lime in syrup (Pharm. Journ. vol. xi. p. 34), it appears that the density of a ten per cent. solution of sugar in water is 1·036; and that when such a solution is saturated with lime, its density is 1·053. The specific gravity of Liquor Calcis Saccharatus is 1·052; it is a saturated solution of lime in a 9·1 per cent. solution of sugar, and its strength, as determined by the volumetric solution of oxalic acid, is pretty much what we should expect it to be from Peligot's researches.

Liquor Chlori. The details of the process for making chlorine water are those of the Dublin Pharmacopœia. The London College did not direct that the chlorine should be washed. The Edinburgh formula was quite inadmissible.

Liquor Ferri Perchloridi. Many methods (Pharm. Journ. vol. iv. p. 24), or rather many modifications of one method, have been proposed for making the solution or tincture of sesquichloride—or perchloride, as we are now directed to call it—of iron. They were all bad, but the Pharmacopœia method I regard as the worst of them all; for previous processes at least gave us solutions of the chloride only, however acid or basic they might be. The Pharmacopœia process gives us a mixture of perchloride and pernitrate, for the whole of the nitric acid is not got rid of by ebullition. Now, of all the solid metallic chlorides, I know of none more easy to prepare in a perfectly pure, definite, dry, crystalline condition than perchloride of iron. Pass dry chlorine, at any rate you please, into a quantity of warm iron nails contained in any kind of vessel, and the immediate result is a pulverulent mass of beautiful greenish-brown, iridescent, micaceous crystals of sesquichloride of iron. In any manipulations with the perchloride so obtained, the only point to be remembered is, that they are intensely greedy of moisture, highly deliquescent, so that they must be weighed indirectly rather than directly. In making this salt, I have generally directed students to place the nails in a Florence flask, heated by a spirit-lamp or other small flame, the chlorine delivery-tube passing to the bottom of the flask, and at the close of the operation to somewhat increase the heat so as to sublime the chloride into the upper part of the flask. The flask has then generally been cracked open, and the crystals quickly placed in well-stoppered bottles. In using the salt for making solution or tincture, it is desirable to weigh it and the bottle together without removing the stopper, to then quickly take out at a guess about as much as may be wanted, and, replacing the stopper, to ascertain exactly how much has been abstracted by again weighing the bottle and contents. By a little ingenuity, the salt might obviously be at once sublimed into bottles in definite quantities. The proposal to use sublimed perchloride of iron in making the tincture is not new; Mowbray (Pharm. Journ. vol. iii. p. 389) strongly recommended this proceeding, yet, curiously enough, at the same time suggested a most complicated method of his own devising. If there is any practical objection to the process, or rather product of the process, such an objection has never been satisfactorily and publicly proved to exist.

PROPOSED LEGISLATION AFFECTING PHARMACY.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—The Council appear to me to have produced a Bill which will commend itself to the judgment of the great majority of the trade, and which will be the more approved as the difficulties which beset the question are fairly weighed. It may be reduced to four principles:—

1st. The preservation of the existing privileges in full of all who are now in business.

2nd. The examination of all who shall hereafter profess to make up prescriptions.

3rd. The provision that a simple and practical examination (the Minor one) shall be all that is necessary to set up in business, and that the title "Associate of the Pharmaceutical Society," as a mark of distinction from the uneducated man, shall be secured to all who are so examined, with a full share in the government of the Society.

4th. The retention of the title "Pharmaceutical Chemist," with its privileges, to those who have passed the Major examination.

No doubt there will be men who think this is going too far, who would prefer the plan suggested by the Medical Council and the Poison Bills,—that of examining all who had not been examined, whether in business or not, but this view evidently is not taken by the Council and would hardly be sanctioned by the Legislature; and there will probably be many who think that the proposed measure does not go far enough, and would recommend that chemists and druggists hitherto unconnected with the Society should be admitted without examination to its membership and privileges. It is said, in the first place, that they should have a full share in the management of the body by which they are governed. Now there would be force in this if they were governed at all, but this is not the case. They are registered, and every privilege they possess is assured to them, but they are in no way governed or regulated or interfered with. The Pharmaceutical Society has no power over them, and wishes to have none. They subscribe nothing to it and are in no way connected with it, and to claim for them a right to regulate the affairs and the government of the members of the Society,—a society to which they do not contribute and have even refused to belong,—is just one of those clap-traps which will never have much weight with thinking men. A more plausible measure has been advocated,—to make them eligible for membership on production of certificates satisfactory to the Council; but to this there are insuperable objections. To give the Council the decision whether a man should be received or no, without any test to help them, would lead to such charges of favouritism and injustice and in spite of all the care they could use, to so much that was anomalous and unfair, that either the door must be opened to all, or the selection given up as practically impossible. And if it were otherwise, such a proceeding would be open to this fatal objection, that it would be an abandonment of the principle steadily maintained by the Society, and openly declared to the public and to the Government when the Pharmacy Act was passed. To shut the door after a given date to all but examined men, was what the Act bade them do, and what they promised to do by all their proceedings, and by the lips of the late Mr. Bell and all others who publicly spoke for them. In the faith of this, the public are slowly learning that the name "Pharmaceutical Chemist" is from year to year growing to designate educated and examined men. The Government is opening to them, as worthy, the various offices in its gift. The medical profession are acknowledging their qualification, and to deliberately knock all this down for the sake of gaining a few outsiders who have never cared to belong to the Society, until they now see its substantial benefits, would be to lower ourselves irretrievably in the estimation of all; to be palpably unjust to nine hundred men who have with cost and pains passed an examination; to show ourselves unfit to be trusted with the confidence of the Legislature; and all this for the sake of a few guineas a year, would be an act of which it would be difficult to say whether the folly or the breach of faith were the most unpardonable.

I quite agree with Mr. Dickenson in his opinion expressed at the special meeting, and would urge the Society not on any account to sacrifice the position they have gained to any clamour from any parties, and least of all to the clamour of those who have always done their utmost to oppose and to injure it.

I am, Sir, yours obediently,

OPIFEX.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—As it has been determined to print in your next number the proposed new Pharmacy Bill, I feel it desirable to express to your readers my conviction that the Bill will require important alterations. For my own part, I regret that it should even be submitted for the discussion of the members and

the public, until its spirit and its letter are more nearly agreed upon by those who have had the opportunity of considering them.

The Bill would, in its present state, press unfairly upon some for whose benefit it is intended; and this is perhaps unavoidable in any Act which has for its object the benefit of any large and varied section of the community. But the evils may yet be very much reduced, and when reduced to their minimum, must be borne for the sake of the general good. But it is not desirable to let it be supposed that we are either blind to, or careless of, the various points which require alteration.

It may be that I take more extreme views than many of my neighbours; and I must now state that this letter is not in any measure official, and I alone am responsible for its contents.

My own conviction is, that one great object would be effected by the Bill in its present state, that is, the registration, officially, of all chemists and druggists actually carrying on the trade. If there had been such a register a few years ago, I am satisfied that all, and not a portion only, of the trade would have been exempted from juries. Had there been such a register at an earlier date, I am satisfied that there would not now be the anomaly of the trade divided into two sections, each of which contains men of superior and men of inferior attainments, instead of the classification indicating the qualifications of the two parties. If the Bill effected nothing else, this registration alone is an object worth all the trouble and expense of an Act of Parliament. It would be the foundation upon which many other good things might be raised from time to time, with comparatively little trouble or difficulty.

But even this matter of registration is not so simple as it at first sight appears; of this any one may convince himself who will endeavour to define a "chemist" so as to include all who carry on the trade of "chemist and druggist," as this term is generally understood, and not interfere with manufacturing and professional chemists. It would be clearly unjust to deprive the latter class of the right to call themselves chemists, and any legislation regarding the title of chemist and druggist would certainly be abortive so long as the titles of "manufacturing and consulting chemist," were not protected.

Again, a difficulty arises in the attempt to restrict dispensing to those who are registered. Turning to first clause, it is said, "It shall not be lawful for any person to carry on the business of a chemist and druggist in the keeping of open shop for the compounding of the prescriptions of duly qualified medical practitioners." If a customer brings a "family recipe," can the unregistered tradesman lawfully prepare it? According to the words of the Bill we might say he could. But suppose the recipe was originally the prescription of a qualified practitioner, we will suppose it to have been copied from 'Graham's Domestic Medicine,' or copied by the customer from an autograph, or copied by the dispenser from an autograph; how will the line of distinction be drawn? To permit the last, is to allow any one to dispense anything from a prescription he first copies. To attempt the prohibition of preparing medicines from published prescriptions would be simply impossible, so long as the keeping and selling of these medicines, simple and compounded, are not also prohibited.

Public safety is more endangered by the *sale* of powerful medicines by uneducated tradesmen, whether they are called chemists or grocers, than it is by the dispensing of medicines from prescriptions; and my conviction is, that useful legislation affecting our trade must be based upon the restriction of the retail sale of poisons and powerful drugs to registered, and ultimately to examined dealers.

There are various clauses affecting the position or standing to be occupied

by different sections of the trade, upon which much might be said; but for the present I can only say that my own desire, and I believe the desire of the Society at large, is to act with the utmost liberality, to throw aside selfish motives, and simply seek the greatest good to the greatest number.

11, *Grey Street, Newcastle, April*, 1864. BARNARD S. PROCTOR.

NOTICE OF MOTION AT THE ANNUAL MEETING.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—It was intended by those who promoted the requisition to the Council for the Special General Meeting of last month, that the resolution then proposed and adopted, declaring the expediency of applying to Parliament for an amended Pharmacy Act, should be followed by the proposal of a *second* resolution, affirming the desirability of, at the same time recognising as eligible to election for membership under such amended Act, all *bonâ fide* chemists and druggists who are as yet unconnected with the Society, and who, within a given time after the passing of such Act, might apply for the privilege.

It was impossible to foresee that in the discussion that took place on the *first* resolution, almost all the speakers would address themselves to that which would have been the point of the *second.* Reference to your report of the proceedings will show that the general expression of feeling was decidedly in favour of "opening the door;" but as the resolution then before the meeting did not actually embrace this point, the vote was not taken upon it. After three hours' debate, those who were present became naturally desirous of hearing the heads of the measure proposed by the Council, and no convenient opportunity afterwards offered for introducing further discussion.

In justice therefore to the members of the Society, I ask your permission to state, that at the ensuing Annual Meeting a resolution will be offered for adoption equivalent to that which I have here referred to as having been contemplated at the Special General Meeting.

As matters now stand, it is, I think, very desirable to have the clearly ascertained feeling of the Society on the subject, and with your permission I will state why it is that I hope an affirmative vote will be given.

At the very first Pharmaceutical Meeting, held on the 11th of May, 1841, a paper was read by the late Mr. Jacob Bell, "On the Constitution of the Pharmaceutical Society." That gentleman wrote—"The ultimate objects contemplated in this Society are the union of the chemists and druggists into *one* ostensible recognized and independent body."

"They consider that their own interest, as well as the safety and welfare of the public, demand that no person shall dispense medicines *who has not undergone an examination* as a test of his competence."

Again, at the public meeting held on the 15th of April, 1841, the Committee who originated the Society reported that it had for its object "the union of the members of the trade *into one body.*"

As one of the founders, I can confidently affirm that I do not remember to have heard of any abandonment of these fundamental principles.

True it is that many persons refrained from joining the Society on the several occasions when it was open to them to do so; but surely their apathy does not affect the true policy of the Pharmaceutical Society, or the objects for which it was designed. I contend that this policy has been to look forward to the day when examinations would be made *compulsory,* and until that day arrived (as on past occasions, so on the present) to strengthen the Society by the admission of all chemists and druggists (duly certified) whose standing and personal influence may help to forward our great object.

We all know that the original Pharmacy Bill of the late Mr. Jacob Bell was

mutilated in the House of Commons, and that in its emasculated condition it was impotent to effect the large public benefit hoped for by its designer. We have already declared that it is now expedient to make a renewed application to Parliament, and if we are to succeed, we must go with a liberal and unselfish measure.

Something has been said relative to injustice to existing members. This cannot apply to the FOUNDERS, for they began by expressing their wish to include the entire body of chemists; it cannot apply to members admitted themselves by election, for the measure of grace which they have availed of they would scarcely refuse to others; whilst the liberal tone of those speakers at the Special Meeting who are members by examination, (Mr. Giles, Mr. Vizer, Mr. Breton, and others), as well as the fact of the requisition having been signed by, I believe, nearly eighty examined men, is, I take it, a fair indication of the feeling entertained by these gentlemen.

In conclusion, I would earnestly appeal to the members of every class to join hand in hand in promoting a large, friendly, and comprehensive measure, sincerely convinced that *with such action* a great public good, as well as a great professional advantage, may probably be secured, and the Pharmaceutical Society assume larger proportions as a National Institution.

I am, Sir, your obedient servant,

30, *Bucklersbury, London, April 20th*, 1864. B. B. OBRIDGE.

SPECIAL GENERAL MEETING.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—As my attention has been directed to either an error in the report of my remarks at our late Pharmaceutical Meeting, or I introduced the word "*local*" unintentionally when I alluded to the proceedings of the meeting at Birmingham, and as I see that Mr. Buott has referred to it in a letter published in the last number of the 'Chemist and Druggist,' I think it but justice to Mr. Whittles, the *local* Secretary of the United Society at Birmingham, to say that my observations were not intended to apply at all to him, but to Mr. Buott, the *general* Secretary of the Society, whose remarks I still think were calculated to excite a feeling of opposition to the Pharmaceutical Society, in the minds of those present, whether belonging or not to the United Society, which he there represented. I regret as much as himself the "undignified" proceedings of the meeting, whereby all calm and dispassionate discussion was entirely prevented.

I am, Sir, yours respectfully,

E. HOLLIER.

Market Place, Dudley, April 20, 1846.

ON PERCOLATION.

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

Gentlemen,—I think a few words in reply to Dr. Redwood's observations on the process of percolation is called for, to prevent chemists from supposing that this process is a very difficult and uncertain one. Dr. Redwood says that the process only succeeds well when performed by those who make it their study, and practise it *con amore*. I at one time held the same opinion, but since then I have found it is quite practicable to reduce it into a rule; for each preparation can be manipulated with,—just as each separate formula for a box of pills. I hold that a percolator can be managed with as great ease as a pestle and mortar, and one requires no longer time to learn how to use than the other. It seems a great pity that a process which yields so much

more certain a result than the process of maceration should be overthrown, because chemists do not care for the trouble of teaching their apprentices the best method of using this valuable apparatus. I trust that some of our country members, many of whom I know advocate the process, and who can furnish most practical results, will state their experience, that we may have this subject thoroughly well ventilated.—I am, yours respectfully,

150, *Oxford Street.* W. A. SANGER.

UNGUENTUM HYDRARGYRI NITRATIS, P.B.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—The British Pharmacopœia is now fairly before your readers, and each of us has had by this time a fair opportunity of examining, and of forming his own estimate of the work, whether favourable or otherwise. That its formulæ and processes represent Pharmacy up to the present time, few, after the severe criticism it has undergone, will be bold enough to assert; but, in justice, I think it must be conceded as a whole to be a decided improvement on the London edition; and as soon as we have recovered from the unpleasant interference with our ordinary processes, the unprivileged trespass on custom, the never-welcome call to sudden progress, it will not then be considered the hireling it now seems.

Still, taking this most charitable view of its teachings, I think, among others, the vague process given for making Unguentum Hydrargyri Nitratis one that will admit of some improvement. We are directed "to melt the lard in the oil by a steam or water-bath . . . and while the mixture is hot add the solution of mercury, also hot." It might also have been further added—and your result will be a most uncertain one; for, supposing the temperature of hot to be, say 200° F., or upwards, which is perfectly natural, seeing that it is readily obtainable by a steam or water-bath, and your acid to have a sp. gr. of 1·5, the action would take place so violently on mixing, as to be perfectly uncontrollable, and the heat generated sufficiently great (together with the action of a strong acid), to partially carbonize the fats, and form an ointment granulated, and chocolate-coloured; this would even be the case at some 20° less than the temperature above indicated, although not to the same extent. It will also vary in colour or consistence, with every considerable variation of the heat employed lower than this, thereby showing the necessity of an arbitrary standard if the result is to be uniform.

The directions of the London Pharmacopœia were not by any means more explicit, but the acid there ordered being considerably weaker (and supposing it to have a composition of $NO_5HO+3HO$, the acid of sp. gr. 1·42 sufficiently strong to effectually peroxidize, and to form an acid solution of the mercury), was much more manageable in its action than the present powerful preparation.

If, on the other hand, too little heat have been used, either the ointment will become so hard in a short time as to be useless, or will have a dirty-green colour, not at all like the beautiful citron of a nicely-made ointment; these latter results have, however, been effectually guarded against in the British Pharmacopœia, by ordering heat to be applied till the mixture froths up, if it does not when the solutions are first put together. Here, again, if operating on large quantities, great caution will be necessary,—to remove the vessel from the source of heat immediately the slightest effervescence commences, to stir vigorously, and should the action be taking place with too much violence, to moderate it by floating the dish on cold water, or the before-named denials to a good product will be here repeated. So, it will be seen, some trouble and care is required to ensure anything like a satisfactory ointment; and no matter what particular method of procedure be followed in manipulating with such a strong acid, the greatest caution and observance will always be necessary.

Taking our new monitor as the authority we are all now, as well by law as by duty, bound to, my own experience leads me to fix the best temperature for mixing the acid nitrate with the melted lard and oil at 150°, or if operating largely at 145°, or a little lower; even for small experimental purposes a heat of 160° may be used, but much beyond this, I have never succeeded in obtaining a satisfactory result. At a heat of 145° to 150°, the decomposition commences slowly, proceeds rapidly and controllable, and continues till perfected, resulting in an ointment of fair colour, nice consistence, and from my own limited experience so far, one that will keep well; though certainly not in any of these respects equal to where an equivalent of weaker acid has been employed in the manufacture.

It occurs to me here also to mention, as having a side-connection with my present subject, the Liquor Hydrargyri permits acid, which is stated in the first, or materia medica part of the P. B., to be used in the proportion of Ung. Hyd. Nit.; this I take simply to be a typographical error, for although doubtless an analogous preparation is added to the ointment, yet it cannot be intended to be conveyed there in this particular solution, or why the formula? And further, *en passant*, if I understand correctly, the explanation given by a distinguished member of the Pharmaceutical Society (who conducted the B. P. experiments on collodion) for the insolubility of pyroxylin, was, his process was conducted with a nitric acid of sp. gr. 1·42, believing this the strength about to be adopted in the new work; it therefore immediately suggests itself, was this misconception confined only to the preparation of collodion, or was the ointment under consideration another exception also to the use of B. P. nitric acid?

I remain, yours faithfully,

Bristol. JOHN BOUCHER.

ACCIDENTAL POISONING BY STRYCHNIA.

On Saturday, April 16th, an adjourned inquest was held at Liverpool, relative to the death of Mr. John Lingard, a Liverpool tradesman. On the 11th of April, Mr. Lingard, having a cold, received a prescription from Dr. Nottingham; the prescription was for a powder consisting of James's powder and Dover's powder, and was made up at the shop of Messrs. Clay and Abraham, Bold Street. About half an hour after taking the powder, Mr. Lingard expired in great agony, the symptoms being those of poisoning by strychnia. A *post-mortem* examination of the body was ordered by the coroner, and the contents of the stomach were analysed by Dr. Edwards, who reported as follows:—

I am an analytical chemist, and lecturer on chemistry and medical jurisprudence at the Liverpool Royal Infirmary School of Medicine. On Wednesday last I received from Dr. Nottingham, in this court, four jars covered with bladder, tied, and sealed; these I conveyed to my laboratory, and examined in the presence of Dr. Nottingham and Dr. Smyth, and labelled their contents as follows:—No. 1, stomach, portion of duodenum, spleen, and heart; 2, liver; 3, blood; 4, kidneys. I proceeded at once with the analysis of the contents of the stomach, dividing it into two equal portions; one-half I digested with oxalic acid to dissolve the organic salt present, and separated the dissolved portion from the residue by filtration and decantation. I then separated the oxalic acid by nitrate of lime, and agitated this aqueous mixture with pure ether and caustic potash. By this process those vegetable alkaloids soluble in ether, such as strychnia, are separated from others, and from the usual animal and vegetable matters present in human food. The ethereal solution was then decanted, filtered, and evaporated to dryness. The residue thus obtained was then dissolved in chloroform, the solution filtered and evaporated to dryness, the residue treated with strong sulphuric acid to destroy extraneous colouring matter; the acid was then neutralized with caustic potash, evaporated to dryness, and treated with fresh ether; this ethereal solution dried, and the residue dissolved in pure chloroform. After these several purifications a colourless residue was obtained, which, when a slight portion was applied to the tongue, gave a peculiar and strongly bitter taste, which remained on the palate for more than an hour. This process was completed on Friday afternoon, when, in the presence of Dr. Notting-

ham, Dr. Smyth, and Mr. W. Harris, I applied to a portion of this residue the appropriate tests for the detection of strychnia. These were four in number—1. Bichromate of potassa; 2. Ferridcyanide of potassium; 3. Permanganate of potassa; 4. Binoxide of manganese. These tests were severally applied to the residue moistened with strong sulphuric acid. In each case a brilliant change of colour was produced, passing through all the colours of the spectrum, from deep blue through violet, purple, orange, and red, to a pale flesh-colour. I applied these tests repeatedly with the same result, and in every respect they corresponded in appearance with strychnia; and I know of no other substance which, after such a process of purification, would exhibit any of these reactions. I dissolved a portion of the same residue in acetic acid, and administered it on Thursday afternoon to two frogs and a white mouse, in the presence of Drs. Nottingham and Smyth. I administered it to the frogs by inserting a few drops under the skin. To the first frog I applied it over the upper portion of the spine. In six minutes the frog was thrown into spasmodic convulsions, which precisely corresponded with the physiological effects of strychnia, and continued for about four hours, when the animal died. To the second frog I applied a few drops of the same solution under the skin of the thigh, and convulsions of a similar character commenced in three-quarters of an hour, and terminated fatally about five hours afterwards. I administered a few drops to the mouse by the mouth. I observed no effect for three hours afterwards, except general uneasiness, a raising of the fur, and occasional palpitation of the chest and laboured breathing. It was put aside in a quiet place for a few hours, and when again observed, appeared drowsy and unwilling to move. After taking a little water and being thoroughly roused, it fell into a tetanic convulsion of a strychnoscopic character, and shortly afterwards had a series of similar spasms, with short intervals during half an hour, and died about eight hours after administration of the poison. I repeated these experiments in the presence of Dr. Nottingham, Dr. Smyth, and Mr. Harris, on Friday, with the more perfectly purified residue then obtained, upon two frogs, with a similar result. From the above experiments I have no doubt that the contents of deceased's stomach contained a fatal quantity of strychnia. A second portion of the contents of the stomach, treated with acetic acid and the solution tested with a persalt of iron, gave the reactions of meconic acid in small proportion, which is one of the constituents of Dover's powder. Another portion of the same solution, treated with pure hydrochloric acid, was boiled some time in contact with slips of copper, for the purpose of discovering the presence of antimony, one of the ingredients of James's powder; but no deposit could be obtained. A second portion was similarly treated, with a like negative result. One-half of the insoluble portion of the contents of the stomach was then dissolved in hydrochloric acid, and tested in the same way for antimony; but none was discovered. I tested a portion of James's powder obtained from Messrs. Clay and Abraham's dispensing bottle; $\frac{1}{4}$ of a grain of the powder gave in a few minutes a characteristic deposit of antimony upon copper by the same process; and I also tested another portion, and found it quite free from any trace of strychnia. I have commenced the analysis of other portions of the body, for the detection of absorbed strychnia by a similar process; but the quantities in these cases being extremely minute, the operations are proportionately tedious, and will probably extend over several weeks, but will not materially add to the value of the present evidence, as far as the purpose of this inquiry is concerned.

In reply to a question, Dr. Edwards stated that he was not prepared to say what was the cause of death; that was a question for medical men. Dr. Edwards said he was well acquainted with the arrangements of Messrs. Clay and Abraham's establishment, which he considered to be exceedingly good, and he knew that elaborate pains were taken to have the prescriptions checked; but it was proved that the bottle containing the strychnia, although bearing a conspicuous label of the word "Poison," was kept on the same shelf as the James's Powder, and separated from the latter by only one other bottle.

It appeared from the evidence that the prescription was made up by Richard Poole, who stated that he believed that he dispensed it correctly; he had no doubt in his own mind that he used James's powder. He had been about two years in the service of Messrs. Clay and Abraham, during which time he thought he had made up between 50,000 and 60,000 prescriptions. After hearing the whole of the evidence, which had occupied the court more than five hours, the coroner summed up the case, and the jury returned a verdict to the effect that Mr. Lingard came to his death by the culpable neglect of Richard Poole in making up the medicine. In reply to the coroner, the foreman said their ver-

dict was one of "Manslaughter." The jury also made a presentment to the effect that there might be a better arrangement of the bottles than at present adopted by Messrs. Clay and Abraham. Richard Poole was liberated on bail, himself in £100, and two sureties of £50 each.

We find that both "poison labels" and "poison corks" were brought into court, and their advantages in preventing accidental poisoning pointed out; but it will be observed that one fact elicited in evidence was a far more important element in this melancholy case, than the absence of either "poison labels" or "poison cork," viz. that the strychnia was kept in a state of *powder*, and not in its *crystalline* form, as should always be the case; for it would have been almost an impossibility to have weighed five grains of these crystals without detecting the mistake; and the alleged advantage of having strychnia in a state of powder for the convenience of weighing small quantities is practically of no importance.

ASAFŒTIDA IN AFFGHANISTAN.

A SUPPLEMENTARY NOTE. BY M. C. COOKE.

To what was before known with certainty of Asafœtida in Affghanistan may be added the following particulars, communicated principally by Dr. Bellew, who was formerly attached to the mission to Kandahar. Some portion may be a repetition of the same facts previously obtained by other travellers, and which are hereby corroborated; for other information now communicated for the first time, Dr. Bellew is mainly responsible. This brief notice can, however, only be regarded as supplementary.

The asafœtida of commerce is obtained from only one plant in Affghanistan, viz. *Narthex asafœtida*. It grows wild on the hills about Herat and Furrah, and is never cultivated, though hundreds of the Kakar tribe from the Boree valley, who collect the gum, remain in the deserts to tend and water the plant.

The "tear" sort is the gum resin that exudes, and dries drop by drop, from incisions around the top of the root; the "lump" sort is the gum resin as it exudes from a broad surface, as when the top of the root is sliced off. The latter sort is more frequently met with than the former, but I do not know of any difference in the qualities of the two sorts. There are several other umbelliferous plants in Affghanistan which resemble the asafœtida plant in external appearance, and which also, like it, when wounded, exude a milky viscid sap, but I never heard that the sap of these plants (also gum resins) was ever collected by the natives, though the plants are very abundant, especially on the western slopes and ranges of the Sufaid Koh.

The frail vaginated stem, or the lower cluster of sheathing leaves (of the asafœtida plant)—the former belonging to old plants, and the latter to young ones—is removed at its junction with the root, round which is dug a small trench about six inches wide and as many deep. Three or four incisions are then made around the head of the root, and fresh ones are repeated at intervals of three or four days; the sap continuing to exude for a week or fortnight, according to the calibre of the root. In all cases as soon as the incisions are made, the root-head is covered over with a thick bundle of dried herbs or loose stones, as a protection against the sun; where this is not done the root withers in the first day, and little or no juice exudes. The quantity of asafœtida obtained from each root varies from a few ounces to a couple of pounds weight, according to the size of the roots, some being no bigger than a carrot, whilst others attain the thickness of a man's leg. The quality of the gum differs much, and it is always adulterated on the spot by the collectors before it enters the market. The extent of adulteration varies from one-fifth to one-third, wheat or barley-flour or powdered gypsum are the usual adulterants. The best sort, however, which is obtained solely from the leaf-bud in the centre of the root-head of the newly sprouting plant, is never adulterated, and sells at a much higher price than the other kinds. The price of the pure drug at Kandahar varies from four to seven Indian rupees per "man-i-tabriz" (about 3 lb.), and of the inferior kinds from one and a half to three and a half rupees per "man." The asafœtida is commonly used by the Mahometan population of India as a condiment in several of their dishes, and especially mixed with "dal." It is not an article of general consumption in Affghanistan, though often prescribed as a warm remedy for cold diseases by the native physicians, who also use it as a vermifuge. The fresh leaves of the plant, which have the same peculiar odour as its secretion, when cooked, are commonly used as an article of diet by those

near whose abodes it grows; and the white inner part of the stem of the full-grown plant, which reaches the stature of a man, is considered a delicacy when roasted and flavoured with salt and butter.

⁎ The annual value of the asafœtida trade with India is estimated in the Government Reports of the North-West Provinces at about £2200.—*From the Technologist.*

HOW THE CHINESE MAKE DWARF TREES.

We have all known from childhood how the Chinese cramp their women's feet, and so manage to make them "keepers at home;" but how they contrive to grow miniature pines and oaks in flower-pots for half a century has always been much of a secret. It is the product chiefly of skilful, long-continued root-pruning. They aim first and last at the seat of vigorous growth, endeavouring to weaken it as far as may consist with the preservation of life. They begin at the beginning. Taking a young plant (say a seedling or cutting of a cedar), when only two or three inches high, they cut off its taproot as soon as it has other rootlets enough to live upon, and replant it in a shallow earthen pot or pan. The end of the taproot is generally made to rest on the bottom of the pan, or on a flat stone within it. Alluvial clay is then put into the pot, much of it in bits the size of beans, and just enough in kind and quantity to furnish a scanty nourishment to the plant. Water enough is given to keep it in growth, but not enough to excite a vigorous habit. So, likewise, in the application of light and heat. As the Chinese pride themselves on the shape of their miniature trees, they use strings, wires, and pegs, and various other mechanical contrivances, to promote symmetry of habit, or to fashion their pets into odd fancy figures. Thus, by the use of very shallow pots, the growth of the taproots is out of the question; by the use of poor soil and little of it, and little water, strong growth is prevented. Then, too, the top and side roots being within easy reach of the gardener, are shortened by his pruning-knife or seared with his hot iron. So the little tree, finding itself headed on every side, gives up the idea of strong growth, asking only for life, and just growth enough to live and look well. Accordingly, each new set of leaves becomes more and more stunted, the buds and rootlets are diminished in proportion, and at length a balance is established between every part of the tree, making it a dwarf in all respects. In some kinds of trees this end is reached in three or four years; in others ten or fifteen years are necessary. Such is fancy horticulture among the Celestials.—*The Technologist*

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.

We acknowledge the reception of a pamphlet of thirty-six pages, exhibiting the present condition and scope of this Institution, and embracing extracts from the Charter, Pharmacy Act, and Bye-Laws of the Society, and the regulations of the Board of Examiners and of the School of Pharmacy, etc. We have not space to devote to an analysis of this pamphlet, but will say that it exhibits a prosperous condition of the Pharmaceutical Society, and an outline of the labours carried on under its auspices, in its School of Pharmacy, its Museum, its Laboratory, and the various examinations imposed on it by the Pharmacy Act, etc. With ample means, and a large and varied amount of talent in the ranks of its members, this Society has made great advances in the improvement of our scientific art, and has shed its light freely for the advantage of the profession at large.—*American Journal of Pharmacy.*

MISCELLANEA.

Suicide by Prussic Acid.—On Wednesday, January 27th, Mr. Humphreys held an inquest at the White Hart, Clipton Street, Finsbury, on the body of Mr. G. W. Head, aged 52.—The deceased had carried on business for many years as a chemist in Sun Street. He was latterly very desponding, as he had some reason to believe that his premises would be taken down for the Metropolitan Railway extension. On Monday, after breakfast, he was apparently much dispirited, and went upstairs. At four o'clock his assistant found him lying on the sofa, quite dead. Dr. Chandler said he was called in to the deceased, and found him quite dead. On the table at the other side of the room was an empty phial, labelled "Scheele's solution of hydrocyanic acid." By the side of the

bottle was the following note, in the handwriting of the deceased:—"John and Frederick are provided for, and therefore I do not now so much care to live any longer. Good-bye, my darling boys! You know not what I may feel, but I have never ceased to love you, as I always did. God bless you, my dear boys!—G. W. H." Deceased had no pecuniary or domestic grief preying on him. He was latterly, however, much affected, and was at times incoherent. The jury returned a verdict of "Suicide while in a state of unsound mind."

Poisoning by Arsenic.—An adjourned inquiry into the circumstances connected with the death of Emma Hutchins, was resumed on Friday, December 18, at the Horseshoe Inn, Waltham, near Leicester. On Friday, the 4th December, at four o'clock in the morning, the servant of Mrs. Hutchins was called up to attend to her mistress, whom she found very ill, and who complained of having taken something which she thought was magnesia, but which she said tasted like copperas. She also said that her husband stood over her and made her take it, telling her it was magnesia, and that after she had swallowed it he admitted that it was arsenic. A surgeon was sent for and every possible remedy was applied, but the unfortunate woman died about ten hours after she had swallowed the poison. Her husband was suspected, and upon being arrested said that if his wife was dead she had died from poison. He was taken to the gaol at Melton, and an inquest was held on the body of the deceased. A *post-mortem* examination was made by Mr. T. L. Barwis and Mr. H. Marryan, who found the viscera strongly congested, and indicative of inflammatory action. Portions of the viscera were forwarded to Professor Taylor, from whose report it appeared that the quantity of white arsenic found in the stomach and its contents amounted to seven grains. In the stomach traces of antimony were detected, mixed with the arsenic, but this was accounted for by the fact stated by Mr. Barwis that during the illness of the deceased a preparation of antimony (tartar emetic) had been administered to the deceased. Taking all these appearances into consideration, Dr. Taylor was of opinion that the deceased had died from effects of arsenic. Mr. Barwis and Mr. J. H. Marryan concurred in the opinion that arsenic was the cause of death. The jury returned a verdict of "Wilful Murder against John Hutchins." He was accordingly committed on the Coroner's warrant.

Effects of Sugar and Tobacco on the Teeth.—We find by the 'Dental Review' that this question was discussed at a congress of German surgeon-dentists recently held at Frankfort; and that the Congress decided in both instances that the articles, when taken in a pure state, and not in immoderate quantities, are not injurious.

A New Grain.—It is stated in the 'Carlisle Patriot' that in consequence of the publication of several letters by Mr. Gillbanks, describing the scarcity of wild-fowl and other once numerous birds, and ascribing it to the disappearance of their natural food, attention has been directed to the subject. Some gentlemen in her Majesty's service, during their explorations in a wild part of our North American possessions, were struck with the pertinacity with which immense flocks of wild-fowl and other game haunted certain localities. It was found on investigation that they came to feed on a sort of rice which was indigenous to the place, and renewed itself by shedding its seed in the alluvial deposit. Some of this grain has been sent to Mr. Gillbanks, who will experiment on the same, and report the result. It is said to differ from the "paddy," or national rice of China.

Suicide by Prussic Acid.—An inquest was held at Worksop before Mr. T. Denmans, on the body of a young man named Walter Wells, who died from the effects of prussic acid. The deceased was an apprentice to Messrs. Marris and Draycott, chemists, Worksop. From a letter found in his pocket, he appears to have imagined that he was badly treated by a person named Griffiths. As there was no doubt that the deceased had poisoned himself with prussic acid, the jury found a verdict of "Temporary Insanity."

Iberis amara.—It is stated in the 'Medical Times and Gazette' that the *Iberis amara*, or candytuft seed, is used by Dr. Wilks as a purgative medicine. The seeds, when bruised and made into a pill of four or five grains, are said to act as a good purge. About twenty cases have been treated, and its purgative action well tested.

Gelatinized Chloroform.—Chloroform, as well as ether, possesses the property of intimately mixing with albumen, first forming a liniment and then a light jelly, which is often of much more easy application than the volatile substance which gives rise to it.

M. Grimault supplies a formula for its preparation independently of any pharmaceutical apparatus. It suffices to shake up in a phial two volumes of white of egg and one volume of chloroform. Providing that the chloroform be pure, or at least is devoid of foreign bodies (alcohol or acid, for example) liable to coagulate the albumen, the jelly forms of itself, and can be preserved for several days without separation.—*Bull. de Thérap.* vol. lxiii. p. 559.

The Chemical Manufacture of Matches.—At the annual distribution of prizes and certificates to the successful candidates at the examinations of the Museum of Irish Industry, October 1st, Sir Robert Kane delivered a lecture "On the Chemical Manufacture of Matches." He described the mode in which the manufacture of matches was carried on, availing himself of some models and samples, for which he expressed himself indebted to Mr. Johnson, of Ardee Street, who was, he believed, the principal manufacturer of matches in Dublin. The importance of the manufacture might be estimated from the following statistics:—The number of matches manufactured in Great Britain was about 40,000,000 a day; in addition to which the importation of foreign matches was five times as great, so that the total consumption of matches might be estimated at 240,000,000 a day. The manufacture of this immense quantity gave employment to a large number of workmen, and it was satisfactory to know that, owing to recent improvements, the diseases formerly incident to the manufacture were now avoided.

A Volatile Alkaloid in Digitalis Purpurea.—By treating the fresh leaves of foxglove in the same manner by which conia is extracted from hemlock, they yield a volatile alkaloid, which the discoverer, W. Englehardt (Zeitschrift für Chemie u. Pharm. 1862, December, p. 722) has named *Digitalium fluidum*, and which, from the experiments made with it on animals, appears to be the real bearer of the physiological action of this plant. This alkaloid is exceedingly volatile, of an oily consistence, an alkaline reaction, difficultly soluble in water, readily so in alcohol, little soluble in chloroform, and soluble in absolute ether. Its odour is very penetrating, intermediate between that of conia and nicotina: when diluted it is not so unpleasant (Neues Jahrb. f. Pharm. Januar, 1863. xix. p. 29.)—*American Journal of Pharmacy.*

Dangerous Lamp Oils.—At the meeting of the Association of Medical Officers of Health, held on Saturday, February 20th, at the Scottish Corporation Hall, a paper was read on the recent petroleum accidents, and on the ready detection of dangerous lamp oils. It was shown that these accidents had invariably resulted from the employment of oils capable of being ignited at a very low temperature, in many cases even below the standard of the Petroleum Act; one very severe accident being traced to the employment of an oil giving off inflammable vapour at a temperature below the freezing point of water. The author of the paper, Mr. Tegetmeier, exhibited a very easy and practical mode of detecting dangerous oils. Two teacupfuls of boiling water and one of cold water (at the ordinary temperature of a sitting room) were mixed together in a small basin; a cupful of the water was then taken, and a teaspoonful of the oil to be tested poured on its surface; in a few seconds a light was applied to the oil. The dangerous oils, those capable of igniting below 128 degrees, immediately took fire, whereas it was shown to be impossible to ignite those which were of a safe and non-explosive character. In the conversation that ensued, Drs. Letheby, Lankester, and R. D. Thomson took part, and the desirability of raising the standard of the Petroleum Act from 100 to 125 degrees was discussed; many accidents, some of a fatal character, have arisen from the employment of oils having a higher inflaming point than 100 degrees Fahrenheit.—*Times.*

Destructive Fire at Apothecaries' Hall, Dublin.—A fire broke out in the stores of the Apothecaries' Hall on March 30th, by which a large quantity of drugs and pharmaceutical preparations were destroyed—property to the amount (it is reported) of £15,000. The books and valuable laboratory machinery were saved.

Accidental Poisoning by Strychnia.—On Thursday, February 25th, Sophia Tulloch, servant at the Poor House at Belnaboth, parish of Glenbucket, who had been rather unwell for some time, went to the grocer (Mr. Chree's) at Sunnybrae, in the same parish, and asked for a calomel powder. The grocer's wife—a most respectable woman —who was acting at the time in his absence, unfortunately gave the amount asked

(five grains) of strychnia, by mistake for calomel. When the young woman went home, she swallowed the dose, which was immediately followed by the usual effects—great agony and a rapid dissolution. She was dead in less than fifteen minutes. Deceased was aged 27 years. The case, we hear, is in the hands of the authorities.—*Aberdeen Journal.*

Poisoning by Sulphuric Acid.—A young woman named Brown was tried at Bury St. Edmunds, March 28th, on the charge of causing the death of her illegitimate child by sulphuric acid. The *post-mortem* examination and the analysis proved poisoning by oil of vitrol, but as the jury did not consider the evidence sufficient to prove the administration of the poison by the mother, they acquitted her.

Perchloride of Iron and Collodion.—This combination constitutes a good hæmostatic in the case of cuts, leech-bites, etc. One part of the crystallized perchloride of iron is to be dissolved in six parts of collodion ; but this must be done very gradually, or the heat which is produced will cause the ebullition of the collodion. The mixture is a yellowish-red, limpid fluid, which, when applied to the skin, gives rise to a small yellow pellicle possessed of great elasticity.—*Reine Med.*, Nov. 15, and *Medical Times.*

The Acorus Calamus as a Preventive of Insect Depredations.—Dr. Schultes observes that much use was made by the older naturalist travellers in the East of the powder of the root of *Acorus Calamus* as a preservative against insects, and that he has found it of the highest utility for the protection of herbaria against the ravages of the *Annobium panniceum.* Some of the powder is to be occasionally strewed over the plants, and this insect, beetles, etc., at once desert the spot wherever its smell is perceptible. For the same reason it is a valuable means of preserving zoological collections from insect depredations.—*Buchner's Repertorium*, 1863, No. 8, and *Medical Times.*

Invalid Bath.—A very useful bath has lately been invented by Mr. Maddox, surgical instrument maker to University College Hospital. It is made in such a shape that it can readily be passed under a person either lying in bed or sitting up ; besides which it possesses the advantage that the water cannot be spilt. The part which is likely to be brought into contact with the patient is well padded, and the material of which the bath is made is a guarantee against accidents which sometimes occur with more fragile materials. The bath is both portable and cheap.

REVIEW.

NOTES ON THE BRITISH PHARMACOPŒIA. By A. F. HASELDEN.

This little book contains a great deal of useful information respecting the British Pharmacopœia, and will render material assistance to those who are engaged in studying the new work, and making themselves acquainted with the relations existing between its processes and products, and those of the London, Edinburgh, and Dublin Pharmacopœias. The changes which have been made, as far as relates to additions, omissions, and changes of name, are represented in tables. Then a series of notes are given, in which any peculiarities in the processes are pointed out, and in this part differences in strength or composition, if they exist, in the medicines, as compared with those made by previous processes, are particularly noticed. Many of the remarks which occur in these notes are judicious, the object of the author being apparently rather to explain, than to criticize what he comments upon.

BOOKS RECEIVED.

THE CHEMIST'S PRICE-BOOK, OR RETAIL COUNTER COMPANION. By JOSEPH GODDARD, M.R.S. Seventh edition, enlarged and revised according to the British Pharmacopœia. 1864. London: sold by Messrs. Barclay and Sons, Farringdon Street.

ARCHIVES OF MEDICINE. Edited by LIONEL S. BEALE. Vol. IV. No. 14. London: John Churchill and Sons. Leipzig: Ludwig Denicke.

THE PROCEEDINGS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION FOR 1863. ON THE ECONOMICAL USE OF FUEL, AND THE PREVENTION OF SMOKE IN DOMESTIC FIRE-PLACES, WITH OBSERVATIONS ON THE PATENT LAWS. By FREDERICK EDWARDS, JUNR. London: Robert Hardwicke, 192, Piccadilly, 1864.

THE PRESCRIBER'S PHARMACOPŒIA: containing all the Medicines in the British Pharmacopœia of 1864, arranged in Classes according to their action, with their Composition and Doses. By a Practising Physician. Fifth Edition. London: John Churchill and Sons, New Burlington Street. 1864.

TO CORRESPONDENTS.

Certus.—(1.) The work is not adapted for your use. (2.) Apply by letter, stating name, address, and qualifications, to the Secretary of the Pharmaceutical Society, 17, Bloomsbury Square.

An Intending Student.—Bentley's 'Manual of Botany,' price 12*s.* 6*d.*, is the Text Book used in Bloomsbury Square.

J. Y.—The directions given in the British Pharmacopœia are quite explicit; hence, in the preparation of the Compound Extract of Colocynth, either Resin of Scammony or Commercial Scammony may be indifferently used. It is one of those anomalies (of which there are unfortunately too many) in the Pharmacopœia, but which cannot now be avoided.

Inquirer (New Sarum).—(1.) In October next. (2.) Bentley's 'Manual of Botany,' to page 134, and pages 214–217. (3.) Fownes's 'Manual of Chemistry.' (4.) The time of publication, and the price, have not yet been announced, but it will be got ready as speedily as possibly. You had better apply to the Secretary of the Pharmaceutical Society, 17, Bloomsbury Square, giving name and address, and he will then forward you the Regulations of the Board of Examiners, etc.

Inquirer.—See 'Pharmaceutical Journal,' vol. x. page 321, and vol. xii. page 62; also Bentley's 'Manual of Botany,' page 32 of Preface, and page 478.

Beta (Gloucester).—(1) Acetate of Morphia is excluded from the British Pharmacopœia. (2) The intention of the prescriber should, if possible, be ascertained; at present it would appear that the adoption of the British Pharmacopœia by medical men is the exception, not the rule.

M. P. S. (Haverfordwest); Lemonade Syrup.—The defect referred to would probably be avoided by bringing the Lemon Juice to the boiling-point, and allowing it to become clear before adding the sugar.

Juvenis (Stockton-on-Tees).—An advertisement in the 'Pharmaceutical Journal' would be the most likely means to adopt in this case.

An Inquirer.—*Liquor Quinæ Ammoniatæ*; vol. xiii. page 344.

J. P. (Deal).—(1.) The usual dose, for an adult, of Areca Nut Powder is from one to two drachms, suspended in water, taken fasting. (2.) We are not aware that the publication of such a work is intended.

R. A. P. S. (Manchester), and *M. P. S.* (Bury St. Edmunds).—*Nepenthe* is a preparation of Opium, the formula for which has not been made public.

Chemicus (Hartlepool).—Messrs. Ash and Sons, Broad Street, Golden Square, London.

S. H. (Brighton).—The precipitate in the mixture referred to, is probably tannate of quinine.

Mrs. W. Baines (Brighton), Mr. Rimmington (Bradford), A Correspondent (Mouth of the Thames), Mr. Hollier (Dudley), and Mr. Blanchflower (Great Yarmouth), are thanked for their communications.

Instructions from Members and Associates respecting the transmission of the Journal before the 25th of the month, to ELIAS BREMRIDGE, Secretary, 17, Bloomsbury Square, W.C.

Advertisements (not later than the 23rd) to Messrs. CHURCHILL, New Burlington Street. Other communications to the Editors, 17, Bloomsbury Square.

THE PHARMACEUTICAL JOURNAL.

SECOND SERIES.

VOL. V.—No. XII.—JUNE 1st, 1864.

THE PROPOSED LEGISLATION AFFECTING PHARMACY.

The Anniversary Meeting of the Pharmaceutical Society has been held; it has been well attended, and the character and interests of the Society have been ably supported and advanced in the discussion which took place upon the important subject to which the attention of the members was principally directed, and in the final decision which was unanimously arrived at. If some slight differences of opinion have existed, and still exist, with reference to one or two minor points in the measure about to be proposed to Parliament, it is nevertheless most satisfactory to observe that all the members who have taken part in the discussion of the subject are actuated by similar motives, and that they equally manifest a desire to make any legislative measure that may be obtained or sought for as broad and liberal in its basis as is consistent with the claims and interests of all the parties concerned. There is no wish manifested by any of our members to adopt a selfish or exclusive policy; on the contrary, there is an obvious tendency in the other direction, the first impulse of those who approach the subject being favourable to the promotion of good fellowship with all our brethren. It is only under the stern requirements of truth, consistency, and justice, that open-handed concession is restrained; and even now there is the general, if not universal, feeling that all that can be done should be done to bring as completely and as speedily as possible all the members of the pharmaceutical profession into one organized and united body. But in doing this, which all desire to see done, the recognized principles of our Association must be respected; the professions and promises, on the faith of which we have obtained concessions from the Government, support from the medical profession, and daily-increasing confidence from the public, must be maintained inviolate, and justified by our future conduct. Any act on our part that would be calculated to weaken the impression we have so long laboured to produce, that professional qualification is a necessary condition for association with our body, would seriously damage our cause, and endanger its ultimate success. We are committed to a course from which we cannot safely deviate; and however much our feelings may tend to the extension once more of the liberal invitations we have previously made without avail, we must not forget the terms of past contracts, the principles we have avowed, the promises we have made, and the faith that has been reposed in our repeated assurances.

The Bill that has been prepared by the Council has been fully discussed at the Anniversary Meeting; and the arguments which were advanced in support of the measure as it stood, appeared to carry conviction to the minds of those who had been prepared to advocate an alteration of one of its provisions. The unanimous conclusion arrived at, after a lengthened discussion, was creditable alike to all parties, and we trust it will not be without its influence

upon those whose interests were so warmly advocated, and whose co-operation we may fairly claim.

On the Council now devolves the responsible duty of promoting this measure. They have been urged to undertake it not only by a large number of the members of the Society, but by chemists and druggists unconnected with their Association, and by members of the medical profession, whose opinions are entitled to the highest respect and consideration. It cannot be said that the Council, or even that the Society they represent, have spontaneously taken the position they now seek to occupy with reference to this subject. All parties seem to have coincided in the opinion that if the dispensers of medicine are to be subjected to special legislative interference, any measure with that object ought to be carried into effect through the instrumentality of those who most fully represent the interests of the pharmaceutical body, and it is in this capacity that the Council of the Pharmaceutical Society have been urged to undertake such a responsibility.

The proposition to legislate with reference to pharmacy, on which the present movement has been founded, originated, it will be recollected, some twelve months ago, with the Medical Council. It was proposed to give to the Medical Council the power of controlling the exercise of pharmacy, and of regulating the qualifications of those engaged in the practice of pharmacy. No formal objection was made to this proposition by the Council or the members of the Pharmaceutical Society; but those from whom the scheme originated have since found that it involved more than they are inclined to commit themselves to, and they are now very ready to hand over the responsibilities connected with the execution of the scheme to the Pharmaceutical Society. In the discussion of the subject at a meeting of the Medical Council, Dr. Storrar, the representative of the University of London, said, "Nothing could certainly be more unsatisfactory than the state of Pharmacy in this country; but it would be an unfortunate act of the Council to embroil itself with the druggists. The Council should drop pharmacy, and encourage the Pharmaceutical Society to go on with an independent measure." Dr. Sharpey, one of the Secretaries of the Royal Society, and a Member of the Council nominated by the Government, was in favour of independent legislation for pharmacy, and its separation from medical legislation. Mr. Rumsey, who is also a member nominated by the Government, "was in favour of the objection made by the *pharmaciens* in the country, either that they were the proper persons to regulate their own affairs, or that the Government should do it. He did not see how the management of pharmacy could be committed to a council in which the *pharmaciens* were not represented." Dr. Christison "disapproved of any attempt to introduce pharmacy into the Medical Act. The present state of the practice of pharmacy was a disgrace to the country and to the Legislature. He hoped, however, that the Council would not meddle with the subject, except by offering its aid and influence to any body which should take up the subject of legislation in regard to pharmacy; and he thought that this could be entrusted to no better persons than the pharmaceutical chemists of the country."

It is thus obvious that the Pharmaceutical Society is placed in a position in which it is expected to take some active steps in the direction of pharmaceutical legislation; and at no period have circumstances appeared so favourable as they now appear for the accomplishment of one of the principal objects for which our Association was formed. One of the last acts of the Medical Council in the Session which has recently terminated, was to pass a resolution, "That a communication be addressed to the Secretary of State for the Home Department, drawing his attention to the present defective state of the law regarding the practice of pharmacy, under which any person, however

ignorant, may undertake it; and expressing the opinion of the General Medical Council, that some legislative enactment is urgently called for to ensure competency in persons keeping open shops for dispensing medicines, and for the compounding of physicians' and surgeons' prescriptions."

TRANSACTIONS

OF

THE PHARMACEUTICAL SOCIETY.

AT A MEETING OF THE COUNCIL, *May 4th*, 1864,

Present:—Messrs. Bird, Davenport, Deane, George Edwards, Hanbury, Haselden, Hills, Morson, Sandford, Savage, Squire, and Waugh,—

The following were elected

MEMBERS.

Edinburgh	Buchanan, James.
"	Macfarlane, Andrew Yuile.
Elie, N.B.	Thomson, Charles.
Jarrow	Watson, Richard Thomas.
Lasswade, N.B.	Macdonald, John.
Liverpool	Buck, Jonathan Marsden.
Luton	Giddings, William H. C.
London	Cooper, Albert.
"	Foott, Richard Rogers.
"	Williams, Joseph John.
Malmesbury	Walker, William, junr.
Mauritius	Pochard, Ernest François Marie.

The following were

RESTORED TO MEMBERSHIP:—

William Henry Heelas	Reading.
William Laen	Pembroke Dock.

Resolved—That *free* Laboratory Instruction be given to the successful competitor for the Jacob Bell Scholarships for the ensuing session (1864–65).

BENEVOLENT FUND.

A further sum of one hundred pounds was ordered to be invested in Consols on account of this fund.

A donation of twenty pounds was granted to a widow of a late London Member. And a second grant of ten pounds was also made to the family of a distressed Member in the west of England.

The Secretary announced that he had received a communication from Mr. Frederick Barron, of Bush Lane, to the effect that he desired to become an annual subscriber of a guinea, and having inadvertently omitted to do so on first joining the Society he now enclosed a cheque for twelve guineas, in payment of what he considered back subscriptions.

The following subscriptions were announced as having been received during the month of April:—

Ballard, Edwin, Farringdon	£0	10	6
Barron, Frederick, Bush Lane—	12	12	0
Bateson, Thomas, Kendal	1	1	0
Baynes, James, Hull	£0	5	0
Bishop, Alfred, Mile-End New Town	2	2	0

	£	s.	d.
Bland, John H., Stourbridge ...	£0	10	6
Bond, John, Yarmouth	0	5	0
Bottle, Alexander, Dover	1	1	0
Brailey, Charles, Heavitree......	0	5	0
Breton, Walter, Brighton	0	10	6
Butt, Edward N., 235, Oxford Street	0	10	6
Cooper, George, Exeter	0	10	0
Cornish, William, Brighton ...	0	5	0
Cupiss, Francis, Diss	0	10	6
Davidson, John, Berwick.........	0	10	0
Davies, John L., Hay	0	5	0
Dawe, Sampson, Monmouth ...	0	10	0
Deane, Henry, Clapham.........	1	1	0
Down, Richard H., Torpoint ...	0	5	0
Dyson, William B., 4, Gloucester Road, South Kensington	0	10	6
Edwards, William, Hastings ...	0	5	0
Edwards, William, Denbigh ...	0	5	0
Faulconer, Robert H., Walworth	1	1	0
Fenn, John T., Westminster ...	0	5	0
Fisher and Haselden, 18, Conduit Street	1	1	0
Fletcher, Francis, Cheltenham	0	5	0
Foott, Richard R., Pimlico	0	10	6
Friend, a (per Mr. Deane, Clapham)........................	1	1	0
Gadd, Charles, Vauxhall.........	0	5	0
Glass, John T., Cheltenham ...	0	5	0
Gwatkin, James J., Brighton ...	0	10	6
Hall, Henry R. F., Hull	0	2	6
Howell, Maurice, Peckham......	0	5	0
Husband, Matthew, Exeter......	0	10	0
Hustwick, Thomas H., Hereford	£0	5	0
Jackson, Thomas, Manchester...	0	10	6
Jones, Ellis P., Rhyl	1	1	0
Madge, James C., Devizes	0	5	0
Manifold, John J., Weaverham	0	10	6
Morton, George, Stratford	0	10	6
Morton, Henry, Ramsgate	0	5	0
Musson, T. G., Birmingham ...	0	10	0
Nind, George, Wandsworth......	0	10	6
Palk, John, Exeter	0	10	0
Palmer, Charles F., Birmingham	0	10	6
Palmer, Faithful, Cheltenham	0	5	0
Powell, John, Shaftesbury	0	10	6
Proctor, William, Newcastle-on-Tyne	1	1	0
Rankin, William, Kilmarnock...	1	1	0
Roberts, Albinus, St. Alban's ...	1	0	0
Rogerson, Michael, Bradford ...	2	2	0
Shaw and Brook, Stockport ...	1	1	0
Sircom, Richard, Bristol	0	5	0
Smith, Nathaniel, Cheltenham	0	5	0
Smith, William F., Walworth	0	10	6
Snape, Edward, Birmingham ...	0	5	0
Spencer, Charles, Gravesend ...	1	1	0
Stone, John, Exeter...............	0	5	0
Street, Edward, Cheltenham ...	0	5	0
Tanner, Nicholas W., Exeter ...	0	5	0
Thompson, John, Liverpool ...	0	5	0
Tucker, Charles, Bridport	0	10	6
Waite, Joseph, Cheltenham ...	0	5	0
Walsh, Edward, Manchester ...	0	10	6
Wilkinson, William, Manchester	0	10	6
Young, George, Millwall.........	0	5	0

MEETING OF COUNCIL, *May* 18*th*, 1864,

Present:—Messrs. Bird, Deane, George Edwards, J. B. Edwards, Evans, Hanbury, Haselden, Herring, Hills, Mackay, Morson, Reynolds, Sandford, Savage, Squire, and Waugh.

EXAMINATION, *May* 24*th*, 1864.

MAJOR (Registered as Pharmaceutical Chemists).

Bird, Robert....................................Newark.
Holmes, Edward Morell ....Chelsea.
Iliffe, Thomas Perkins ....Nuneaton.
Payne, Sidney ....Stratford-on-Avon.

MINOR (Registered as Assistants).

Hunt, Charles ....Bristol.
Kinch, Charles Henry ....Henley-on-Thames.
Pugh, George ....Cheltenham.

REGISTERED APPRENTICES.

NAME.	RESIDING WITH	ADDRESS.
Brooks, Thomas	Mr. Swift	Spalding.
Cable, George Hughes	Mr. Roper	Dunmow.
Gillies, John Whitfield	Messrs. Ritson & Sons	Sunderland.
Heale, William	Mr. Hogg	Bideford.
Moulton, James Ebenezer	Mr. Shipman	Northampton.
Petty, William	Ex^{ors} of the late Mr. Severs	Kendal.
Provost, James Ashton	Mr. Giles	Clifton.

Quibell, Thomas Oliver	Messrs. Mountain & Taylor	Wakefield.
Rogerson, William J	Mr. Rogerson	Bradford.
Skillman, James Carnahan	Mr. R. C. Buck	Dudley.
Smith, Walter Henry	Mr. Burden	London.
Smith, John	Mr. Halliday	Manchester.
Smithyman, Joseph	Mr. R. C. Buck	Dudley.
Stevenson, James	Mr. Skinner	Cirencester.
Swift, William Philip	Mr. Swift	Spalding.
Turnbull, Thomas Collings	Mr. R. G. Reading	Warwick.
Tansley, Isaiah	Mr. Chaston	Lowestoft.
Wilkinson, Thomas	Mr. Wilson	Sheffield.
Wilson, John B.	Mr. Mullock	Birkenhead.

PHARMACEUTICAL MEETING.

Wednesday, May 4, 1864.

MR. T. N. R. MORSON IN THE CHAIR.

The following

DONATIONS TO THE LIBRARY AND MUSEUM

were announced, and the thanks of the meeting awarded to the respective donors thereof:—

The Chemical News.
The Chemist and Druggist.
The British Journal of Dental Science.
The Photographic Journal.
The Educational Times.
The Dental Review.
The Technologist.
The Veterinarian.
The Medical Circular.
The Journal of the Society of Arts.
The Journal of the Chemical Society.
Bulletin de la Société de Chimie de Paris.
Bulletin de la Société Botanique de France.
Archives de Médecine Navale. From the respective Editors.
Notes on the British Pharmacopœia. By A. F. Haselden (2 copies).
Dictionary of Chemistry. Part XV. By Henry Watts.
Experimental Essays. By Charles Tomlinson.
A Synoptic Table of the Measures and Weights of the Metric System. By C. H. Dowling, C.E. From the Author.
A Handbook to the same. By James Yates, M.A.
The Chemist's Price Book. By Joseph Goddard.
On the Production and Use of German Yeast in this Country. By J. Mackay. From the respective Authors.
A new Pill Mortar and Pestle. From Messrs. Maw and Son.

The following papers were then read:—

ON THE CINCHONA BARK OF BRITISH INDIA.

BY DR. J. E. DE VRY.

After almost six years spent in Java, in the near vicinity of the Cinchona plantations in that island, I have obtained leave of absence for two years in order to recruit my health by a visit to Europe. During my stay in Java I had heard much about the cultivation of the Cinchona in the Neilgherries and other parts of the English dominions in India, which information rendered me desirous of inspecting some of these plantations on my way home; and although want of time prevented my reaching the plantations in the

Khasea hills, I had the pleasure of examining those of Hakgalle, in Ceylon, as well as those upon the slopes of the Neilgherries in the Madras Presidency.

Before I proceed further I cannot do other than acknowledge my deep gratitude to their Excellencies Sir Charles M'Carthy and Sir William Denison, the Governors respectively of Ceylon and Madras, for their liberality and kind assistance in my inquiries; nor must I omit to mention my esteemed friends Mr. Thwaites and Mr. M'Ivor, who not only promoted my investigations by supplying me with the necessary materials and valuable information, but also by their kind hospitality made my visits to Peradenia and Ootacamund sources of the most agreeable reminiscence.

The system of cultivation *without shade* which Mr. M'Ivor, after careful study of the Cinchona plant in the propagating-house, has put in practice, is very different to that adopted in Java by Mr. Junghuhn, who grows the plants in the dense shade of the virgin forests. Some facts which I observed during frequent visits to the Cinchona plantations in Java induced me to judge less unfavourably of Mr. M'Ivor's system than had Mr. Junghuhn, and I went therefore to the English plantations in order—

1stly. To convince myself by personal inspection, of the healthy appearance and growth of the trees in the open sunshine.

2ndly. To collect bark and leaves of different species of Cinchona, and to investigate them chemically after my return to Europe.

I began my inquiries by visiting Ceylon, where I saw in the botanical garden of Peradenia a few specimens of *Cinchona succirubra*, which as this locality is comparatively but little elevated, being only 1600 feet above the level of the sea, had been planted in the shade. Although the plants looked very healthy, the oldest being from eight to nine feet high, Mr. Thwaites informed me that they grow much better in more lofty situations, such as Hakgalle. Among the leaves of *C. succirubra* which I collected at Peradenia, was one which measured eighteen inches in length and twelve inches in breadth. The leaves collected at this low elevation above the sea have interested me much, because they contain almost twice as much quinovic acid as the leaves of the same species grown in the much loftier situation of Ootacamund.

Upon the beautiful coffee-estate of Messrs. Worms, 3200 feet above the level of the sea, I saw a few specimens of *C. succirubra* and *C. micrantha* growing amongst the coffee-trees, in the most luxuriant state *in the open sunshine*. I was sorry that the paucity of plants prevented my asking for a small quantity of the leaves.

My most interesting visit however as regards Cinchona culture in Ceylon, was that to Hakgalle, situated at about 5200 feet above the level of the sea, where I saw a number of 22,050 plants of different species of Cinchona, under the direct care of Mr. M'Nicoll. The system of planting in this locality is as yet a mixed one, part of the plants being grown in the shade of the forest and part in the open sunshine. The shade of the forest however is not so dense as in Java, so that even trees planted in the shade obtain a certain amount of sunshine. Of the most valuable species, I saw 13,820 specimens of *C. succirubra*, the largest plant, only thirty-one months old, being ten feet high, with the stem seven inches in circumference at the base; and 57 of *C. Calisaya*, the produce of twelve healthy plants obtained from the Dutch Indian Government in Java. During my inspection of the plants I obtained from Mr. Thwaites a dead tree of *C. succirubra* five feet high, with the stem two and three-quarter inches in circumference at the base. I was informed by Mr. M'Nicoll that the loss of his cuttings by death do not exceed one-half per cent.,—a fact which I thought particularly remarkable,

knowing from Mr. Junghuhn's report of the month of December, 1856, that the loss of cuttings in Java had amounted to *ten per cent.*

Having left Ceylon on the 7th of November (1863), I arrived on the 14th of that month at Ootacamund, situated at 7416 feet above the level of the sea. During a stay of sixteen days under the hospitable roof of Mr. M'Ivor, I had the fullest opportunity to convince myself of the excellent state of the Cinchona plants under his care, and of his skilful system of propagation, which has enabled him to increase the number of plants from 1128 on the 30th of April, 1861, to 248,166 on the 31st of October, 1863. One of the most striking proofs of the success of his system of propagation is the fact, that the single plant of *Cinchona Uritusinga* presented to the Government by Mr. J. E. Howard, which was received by Mr. M'Ivor on the 18th April, 1862, had been increased by buds, cuttings, and layers during the following eighteen months to 4733 plants. As my former colleague, Mr. Junghuhn, however, in his pamphlet published at Batavia in February, 1863, and translated from the Dutch by Mr. Clements R. Markham, takes an unfavourable view of the future prospects of Mr. M'Ivor's plants raised by cuttings, buds, and layers, I examined with particular attention the roots of these plants, and found them, as it appeared to me, to be in the most satisfactory condition, so that I was compelled to conclude that the objections of Mr. Junghuhn are without foundation. Having requested Mr. M'Ivor to present me with some rooted cuttings and buds, so that I should be able to show them, partly in a dried state, partly preserved in spirit, to the Minister for the Colonies in Holland, he kindly acceded to my wishes, and I can now give him the satisfaction of knowing that his rooted cuttings and buds have been admired by every one who has seen them. I must, however, candidly admit that there is some truth in the statement of Mr. Junghuhn respecting the unsatisfactory rooting of plants obtained from cuttings; but it applies only in the case of cuttings which are *too large*, such as I have seen in Java. If the cuttings however are made *as small as possible*, in accordance with Mr. M'Ivor's practice, the plants obtained have not in the least degree the defect which has been pointed out by Mr. Junghuhn, and can bear comparison with the best seedlings.

In reference to the system of planting the Cinchona in an open situation without the least shade, I inspected very carefully the Neddiwattum plantations, where this system has been most fully carried out. Although the large leaves of *C. succirubra* had suffered a little from a recent storm, all the plants in the plantation looked very healthy and vigorous, many of them having already attained a height of seven to eight feet. As a hint to the cultivators of Cinchona in Java, I may point out the fact that the experience of Mr. M'Ivor has taught him that if he were compelled to choose an *excess* of dryness or moisture for a Cinchona plantation he would prefer the former.

Having been fully satisfied by all I had seen, I postponed my conclusion till I should have obtained the results of a chemical analysis of the bark, and left Ootacamund carrying with me a great many samples for chemical investigation. The samples thus obtained were the following:—

From Hakgalle in Ceylon, 5200 *feet above the sea.*

1st. *C. succirubra.* A dead tree five feet high, the circumference of the stem at the base being two and three-quarter inches. The roots were very sickly, and produced only 2·37 grammes of bark.

From Peradenia in Ceylon, 1600 *feet above the sea.*

2nd. *C. succirubra.* Leaves of healthy plants.

From Neddiwattum in the Neilgherries, 6200 *feet above the sea.*

3rd. *C. succirubra.* A healthy tree fourteen and a half months old, grown

from a layer. The height was six feet, with a circumference of four and a quarter inches at the base.

4th. *C. succirubra.* Leaves of healthy trees.

5th. *C. succirubra.* Bracts of healthy trees.

6th. *C. succirubra.* Juice collected in making cuttings and buds from healthy trees and dried in the sun.

7th. *C. succirubra.* Bark of a stem eighteen months old *thickened by moss.*

8th. *C. Calisaya.* A sickly plant eleven months old. The height was two feet ten inches, with a circumference of two and a quarter inches at the base. The sickly root weighed when dried only 6·10 grammes, of which 3·25 grammes consisted of bark.

9th. *C. Calisaya.* A healthy plant eleven months old, cut off at the base of the stem. The stem produced 8·7 grammes of dry bark.

10th. *C. pahudiana.* A healthy tree eleven months old. The height was three feet, with a circumference of three and a half inches at the base. The stem produced 11·1 grammes of dry bark. The comparison of this quantity with the quantity of bark from Calisaya of the same age (*sub* No. 9) proves that the bark of *C. pahudiana* has not such an excessive thinness as is alleged by some authors.

11th. *C. pahudiana.* Leaves of healthy trees.

12th. *C. micrantha.* A healthy tree fourteen and a half months old, grown at an elevation above the sea of 5200 feet. The height was six feet three inches, with a circumference of three and one-eighth inches at the base.

13th. *C. micrantha.* Leaves of healthy trees.

The results of the chemical investigation of these materials are contained in the annexed Table, which requires the following explanations. The quantity of quinine has been determined by shaking the solution of the alkaloids in dilute acetic acid with caustic soda and ether, and evaporating the ethereal solution. The quantity of quinine thus obtained is however too great, for cinchonidine, quinidine, and even cinchonine are not insoluble in ether. There is besides another circumstance which increases the apparent quantity of quinine, and this is the existence of an alkaloid which fuses much below 212° Fahr., and is very soluble in ether. My distinguished friend Mr. J. E. Howard was the first who in 1856 pointed my attention to this alkaloid, but neither of us was happy enough to obtain it quite pure. Since that time I have met with it especially in young Cinchona barks, and have now some hope that I shall be able to get it in larger quantities, for I suppose that it must be contained in a great many samples of the quinoidine of trade.

Under the head "Analytical Data" I have mentioned, where such determination was possible, the amount of alkaloids soluble in ether; and when this soluble part gave the reactions of quinine, I have so stated it in the column for quinine. As regards specimen No. 12, that portion of alkaloid soluble in ether which was obtained from the stem-bark of *C. micrantha,* contains not a trace of quinine, but only the still unknown fusible alkaloid, on which account I have entered nothing in the column for quinine, but contented myself with mentioning the amount soluble in ether.

When there was no possibility for *quantitative* separation of the matters soluble and insoluble in ether, but certainty of the presence of quinine, I have signified in the column for quinine the unknown quantity by x, and the matter insoluble in ether by y. Therefore x and y indicate the unknown quantity of a substance which has been proved to be present.

The quinovic acid has been obtained by precipitating it by dilute hydrochloric acid from its compound with *lime.* After drying the precipitate it has been dissolved in alcohol, and the amount of quinovic acid has been de-

Specimens examined.	Alkaloids in 100 parts.	Quinine.	Cinchonine and Cinchonidine.	Cinchonine and Quinidine.	Quinovic Acid.	Analytical Data.
1. *C. succirubra.*						
a. Bark of the stem...	2·100	0·911	1·189		0·580	29·3 grm. bark of the stem produced 0·635 grm. alkaloids and 0·17 grm. quinovic acid. Of the alkaloids 0·267 grm. were dissolved by ether.
b. Bark of the roots...	2·000	*x*	*y*			2·37 grm. bark of the root produced 0·048 grm. alkaloids almost entirely soluble in ether.
2. *C. succirubra.*						
Leaves					2·060	19·7 grm. dry leaves produced 0·407 grm. quinovic acid.
3. *Cinchona succirubra.*						
a. Bark of the stem...	2·657	1·486	1·171		0·398	41·7 grm. of bark of the stem produced 1·108 grm. of alkaloids and 0·166 grm. quinovic acid. Of the alkaloids 0·62 grm. were dissolved by ether.
b. Bark of the root...	7·514	3·443	4·071		0·533	21·2 grm. bark of the root produced 1·593 grm. alkaloids and 0·113 grm. quinovic acid. Of the alkaloids 0·73 grm. were dissolved by ether.
c. Stem-wood					0·212	25·0 grm. dry stem-wood produced 0·053 grm. quinovic acid.
d. Root-wood					0·867	18·8 grm. dry root-wood produced 0·163 grm. quinovic acid.
4. *C. succirubra.*						
Leaves	0·017	0			1·300	32·4 grm. dry leaves produced 0·436 grm. quinovic acid. 76·7 grm. dry leaves produced only 0·013 grm. of very impure alkaloids containing not a trace of quinine.
5. *C. succirubra.*						
Bracts					0·870	15·3 grm. dry bracts produced 0·133 grm. quinovic acid.
6. *C. succirubra.*						
Juice dried in the sun	0	0	0		*x*	2·045 grm. dried juice was proved to contain not a trace of alkaloids, but quinovic acid was readily detected.
7. *C. succirubra.*						
Bark of the stem......	8·409	2·765	5·644		0·530	14·9 grm. dry bark produced 1·253 very slightly coloured alkaloids and 0·08 grm. quinovic acid. Of the alkaloids 0·412 grm. were dissolved by ether.
8. *C. Calisaya.*						
a. Bark of the stem...	1·890	1·220		0·670	0·640	14·5 grm. dry bark produced 0·274 grm. alkaloids and 0·093 grm. quinovic acid. Of the alkaloids 0·177 grm. were dissolved by ether.
b. Bark of the root ...	3·100	*x*		*y*	*x*	3·25 grm. dry bark of the root produced 0·103 grm. alkaloids partially soluble in ether.
9. *C. Calisaya.*						
Bark of the stem......	1·520	0·724		0·796	0·230	8·7 grm. dry bark produced 0·133 grm. alkaloids and 0·02 grm. quinovic acid. Of the alkaloids 0·063 grm. were dissolved by ether.
10. *C. pahudiana.*						
a. Bark of the stem...	0·450	*x*	*y*		*x*	11·1 grm. bark produced 0·05 grm. alkaloids, for the greatest part soluble in ether.
b. Bark of the root...	1·553	*x*	*y*		0·450	11·2 grm. bark produced 0·174 grm. alkaloids and 0·051 quinovic acid. The alkaloids were partially soluble in ether.
11. *C. pahudiana.*						
Leaves	0·010	0			0·150	32 grm. leaves produced 0·048 grm. quinovic acid and 0·004 grm. very impure alkaloids.
12. *C. micrantha.*						
a. Bark of the stem...	2·791	0			0·113	28·3 grm. bark produced 0·79 grm. alkaloids and 0·032 grm. quinovic acid. Of the alkaloids 0·346 grm. were dissolved by ether.
b. Bark of the root...	4·166	*x*			0·678	18 grm. bark produced 0·75 grm. alkaloids and 0·122 grm. quinovic acid. Of the alkaloids 0·15 grm. were dissolved by ether.
13. *C. micrantha.*						
Leaves	traces				1·276	28·4 grm. leaves produced 0·36 grm. quinovic acid. 209 grm. leaves produced only 0·008 grm. very impure alkaloid.

termined by evaporating the *clear* alcoholic solution to dryness. If an alkali is used for dissolving the quinovic acid,—as, for instance, from the leaves of *C. succirubra*,—the apparent quinovic acid is much greater, exceeding even *six per cent.* By treating, however, this *apparent* quinovic acid with milk of lime, one can prove that only a part of it is really quinovic acid, the larger part being probably a pectic substance which forms an insoluble compound with lime. As experiments on a large scale have been made in Java and Sumatra with some pounds of quinovic acid prepared by me in order to determine its medicinal properties, I have thought it desirable to ascertain its quantity in every part of Cinchona which I subjected to analysis. That the quinovic acid is a very essential part of the Cinchona seems to be proved by the result of my experiments on specimen No. 6, the juice of *C. succirubra* dried in the sun, in which not a trace of alkaloids was to be found, whilst the presence of very pure quinovic acid was easily discernible.

The leaves of *C. succirubra*, *C. micrantha*, and *C. pahudiana* contain traces of alkaloids, but I could not find quinine amongst them. The results of experiments on No. 7, *Red bark*, thickened by moss, deserve the greatest attention; for although Mr. Howard had already ascertained that Mr. M'Ivor's experiment of thickening the bark by covering it with moss had been really successful, I was quite struck by the enormous amount of 8·4 per cent. of alkaloids in so young a bark. The other peculiarity of this bark was that I never obtained Cinchona alkaloids so easily pure as from it; hence I hope that the experiment will be repeated by Mr. M'Ivor on a large scale, not only with the *C. succirubra*, but also with other species, and particularly with *C. Calisaya*.

Before I conclude I must still point out the fact that the roots of *all* species of Cinchona which I have investigated, contain a greater amount of alkaloids in their bark than is contained in the bark of the stem. My attention was first fixed on this fact by repeated investigations of *C. pahudiana*. I enter upon no speculation whatever, but must persist in maintaining the fact, which seems not only to be true in British India and in Java, but likewise in South America, for the bark of the root of *C. lancifolia* which my friend Mr. A. Delondre forwarded to me during my stay in Java, proved to contain not less than 8·66 per cent. of cinchona alkaloids.

From the observations I have narrated, I arrive at the conclusion that the introduction of the valuable species of Cinchona into British India has been completely successful, and that nothing is now wanted but a continuance of skilful observation and experiments, in order to make such introduction as lucrative in a commercial as it is interesting in a scientific point of view.

The CHAIRMAN said the meeting was greatly indebted to Dr. De Vry for the valuable paper he had read. There were points in it of great interest. Thus, with reference to what Dr. De Vry had stated concerning the first appearance of quinovic acid in the young plants, it had been observed in other cases, that in plants which ultimately contained alkaloids, the acids with which such alkaloids were associated appeared in the young plants before the alkaloids were found there. Meconic acid, for instance, was found in the poppy before any trace of morphia could be detected there.

Mr. HANBURY drew attention to the rapid increase which was being effected in the cinchona plants. This appeared to be in a great measure due to the superiority of the Scotch process of cultivation introduced by Mr. M'Ivor, which consisted in propagating by cuttings and layers, and not by seeds.

Dr. DE VRY said Mr. M'Ivor employed no seeds in propagating the plants, and found the method of growing from cuttings and buds much easier and more successful.

The CHAIRMAN drew attention to to the statement made of the proportion of alkaloid contained in the bark of the roots. It appeared to him very remarkable. He thought it would be matter of regret that the trees should be destroyed for the sake of the roots only.

Dr. DE VRY said the plants could be multiplied to such an extent as to justify their growth solely for the sake of the roots. In England the root bark was not appreciated, but in France it had been largely sold.

Mr. HANBURY confirmed the statement that the root bark was not saleable in England.

The CHAIRMAN inquired if any benefit had been found to result from the medicinal use of quinovic acid.

Dr. DE VRY had made some experiments on the subject, and intended to publish the results.

Professor BENTLEY looked upon Dr. De Vry's paper as a most interesting one. It would reassure those persons who were doubtful of the success of cinchona cultivation in India, although, for his own part, he had never feared as to the result. The increase of plants had, however, far surpassed all expectation. His principal object in rising was to point out a remarkable fact,—the statement made by Dr. De Vry concerning the proportion of alkaloids found in the root bark. On this point, Mr. Howard had come to precisely opposite conclusions to those of Dr. De Vry. Mr. Howard founded his conclusions on analysis of barks imported into this country; he had shown that the root bark contained only one-tenth part of the quantity of crystallized salt found in the stem-bark,—a statement totally at variance with that made by Dr. De Vry.*

Dr. De Vry explained that he did not stand alone in his experience of the quantity of alkaloids found in the root bark. Delondre had stated essentially the same as himself, that the root bark contained more than that from the stem.

ON SYRUP OF CHLOROFORM.

BY MR. T. B. GROVES, F.C.S.

I presume, from the frequency of its use, that chlorodyne is at least a *convenient* preparation. Of its medicinal value I know nothing.

It was in attempting its preparation, with a view of satisfying myself as to its reported difficulty of accomplishment, that I met with the facts forming the purport of this communication.

It has been proved by experiment that chloroform is soluble in water to the extent of $2\frac{1}{2}$ minims only, per ounce, and that if a spirituous solution of chloroform containing a larger proportion than the above be added to water, the excess of chloroform soon finds its way to the bottom of the liquid, with which no amount of shaking will cause it to mingle sufficiently well to enable the dose to be accurately apportioned. This difficulty has been sought to be remedied in various ways. A Frenchman proposed a syrup of chloroform and glycerine, which he reported to have a marvellous aptitude to combine with water without decomposition. Mr. Squire, however, disposed of that fallacy as soon as it appeared.

Another form, also from a foreign source, consists of $\frac{1}{100}$ of chloroform dissolved in oil and then emulsed with gum and syrups,—probably a good form for sole administration, but ill adapted for combinations.

It occurred to me that if chloroform were reduced to exactly the same specific gravity as the syrup employed, by the addition of a liquid lighter than itself, mixture once effected would be permanent; there could apparently be no tendency to separation if the theory admitted of being practically carried

* Pharm. Journ., vol. v. 2nd ser. p. 312.

out. It was also obviously a *sine quâ non* that the lighter liquid should not be liable to be abstracted by the syrup, or the chloroform would inevitably be precipitated in the globular form, as in the case of chloric ether.

I have succeeded in making such a mixture by reducing the specific gravity of the chloroform by means of ether, and shaking them with a definite amount of syrup. The chloroform manifests no tendency to separation, even when present in the proportion of one-eighth, but a better form is that containing one-twelfth.

The *modus operandi* is as follows:—Put into a twelve-ounce bottle one ounce of chloroform and about three drachms of ether; to the mixture add the same volume of the syrup to be employed; observe carefully the disposition of the fluids, the chloroform and ether will probably sink, then add *guttatim* more ether until the two liquids on being shaken together appear indifferent as to their position in the system; finally fill up the bottle with the syrup, and shake well for a minute or two.

The syrup should not be too dense, or it will be difficult to impart to it sufficient agitation to ensure the complete commixture of the fluids. The syrup should be composed of gum and sugar, of honey or treacle; syrup of sugar does not answer well, apparently on account of lacking viscosity.

The syrup thus formed has the same physical properties as chlorodyne, and, like it, is readily miscible with water in any reasonable proportion (one to seven), and soluble in the water where the proportion of chloroform is within the limits of its solubility.

The advantages attending its use are these:—1st. It does not need special precaution when being added to watery fluids, it being at once diffused completely, and in no case does it give rise to a deposition of large globules of chloroform. 2nd. When added in excess of saturation, the undissolved chloroform is deposited in *very minute globules*, which, after lying together for days, show no disposition to combine, but may by a few shakes be dispersed evenly through the liquid, forming an emulsion sufficiently permanent to enable a dose to be measured without difficulty.

I will conclude by proposing the following form for an anodyne containing chloroform (founded on one published by Dr. Ogden), which will be found to remain combined and to mix readily with either spirit or water:—

Take of Chloroform ʒiv;
Ether ʒiss;
Oil of Peppermint gtt. viij;
Resin of Cannabis gr. xvj;
Capsicum gr. ij;
Macerate for two or three days and filter. (No. 1).
Then take of Muriate of Morphia gr. xvj;
Hydrocyanic Acid Sch. ♏ xcvj;
Perchloric Acid;
Water āā ʒss;
Syrup of treacle (or honey), to make in all 4 oz.

Dissolve the muriate of morphia in about an ounce of syrup, to which has been added the perchloric acid and water, assisting solution by a water-bath, and when cold add the prussic acid.

Here, as it is absolutely necessary to preserve the relative proportions of these potent medicines, and also to include them in a given bulk, the manipulation is not so easy. It is only to be done, so it appears to me, by balancing separately the chloroformic tincture with the morphia syrup, and then again with a plain syrup to be used in making up the exact measure of the completed article. The balancing must be effected by adding water *guttatim* to a syrup

denser than necessary. Then having ascertained by the balance the proportions required, quantities of the *same* materials, no matter how great, can at once be adapted for use without further trouble.

My chief object in giving the details of this process is to enable prescribers to devise for themselves, if they think fit, a form, of the *exact* composition of which they are aware,—an all-important requirement, one would imagine, where remedies of great potency are to be administered.

Mr. HANBURY said that when the subject was announced, it recalled to his mind a paper which appeared in the 'Journal de Pharmacie' a few years ago, which gave a method for suspending chloroform in a mixture. The Société de Pharmacie of Paris appointed a commission on the subject, which gave what was concluded to be the best method. He had brought some specimens made according to this method, and it would be seen they were good and perfect mixtures.

The CHAIRMAN said there was no doubt that if chloroform was added to substances of the same specific gravity they could be made to mix readily.

NOTE ON DISTILLED SULPHURIC ACID.

BY PROFESSOR REDWOOD.

The sulphuric acid of the British Pharmacopœia differs from that hitherto used in medicine in this country. We have been accustomed under the name of sulphuric acid to use commercial oil of vitriol, and this, according to the last London Pharmacopœia, was to have a specific gravity of 1·843. We are now directed in the British Pharmacopœia to use, not commercial oil of vitriol, but distilled sulphuric acid, and this is described as monohydrated sulphuric acid (HO,SO_3), the specific gravity of which is represented as 1·846.

Having had occasion in my lectures on the British Pharmacopœia to remark, with reference to sulphuric acid, that in the processes and descriptions given in that work there are some inconsistencies and errors, I have been called to account for making such a statement on what has been assumed to be insufficient grounds.

The subject is one on which I had worked a good deal some years ago, and my remarks were partly founded on results then obtained, and partly on the published investigations of others. I have since repeated some of the experiments to which I referred, and wish on one or two points to lay the results before the meeting.

Forty-eight fluid ounces of commercial oil of vitriol, of sp. gr. 1843, were put into a small platinum still with one ounce of sulphate of ammonia, and the mixture submitted to fractional distillation. The first distillate, consisting of seven fluid ounces, was rejected. The three subsequent distillates, consisting of three fluid ounces, five and a half fluid ounces, and six and a half fluid ounces, had all very nearly the same specific gravity, ranging from 1841·3 to 1841·5. The next distillate, consisting of seven and a half fluid ounces, had a sp. gr. 1842·3, and the next, consisting of six fluid ounces, had a sp. gr. 1842·5. I observed that all these products had a slight smell of sulphurous acid, the production of which I could only account for by assuming that a portion of the sulphuric acid was decomposed in contact with the heated platinum vessel at the temperature required for the distillation. I ascribed to this decomposition the low specific gravity of the product as compared with what is indicated in the Pharmacopœia, and I therefore relinquished the further use of the platinum still.

Another operation was performed in a glass retort as described in the Pharmacopœia. The specific gravity of the oil of vitriol operated upon in this case was 1844, this being the densest commercial oil of vitriol I was able to get. The process was conducted strictly according to the Pharmacopœia, the first ten

fluid drachms being rejected, and then the product collected until one fluid ounce was left in the retort.

The distillate in this case was free from any smell of sulphurous acid. Its specific gravity was 1843. One fluid drachm (100·8 grains) of this acid was neutralized by 202 measures of the volumetric solution of soda, indicating that it contained more than one atom of water to the atom of anhydrous acid.

CONVERSAZIONE.

The usual annual Conversazione was held in the Society's rooms on Tuesday evening, the 17th of May, and a large number of visitors, together with Members and Associates of the Society, responded to the invitations which had been issued by the President and Council.

The following objects, for which the Council were indebted to the gentlemen who kindly contributed them for the evening, were distributed through the rooms:—Portrait of Jacob Bell, by Sir Edwin Landseer, R.A., from Mr. T. H. Hills; portraits of celebrated scientific men, by J. Gilbert and Walker, and specimen of microscopical writing, from Mr. W. L. Bird; landscapes by Richardson, Copley and Thales Fielding, and the sketch by W. Frith, R.A., from which the "Coming of Age" was painted, from Messrs. Vokins; a handsome and interesting emblematical shield of Shakspeare, from John Leighton, F.S.A.; a rare and valuable German black-letter copy of "Terence," of the fifteenth century, a rubbing from Shakspeare's tomb, and a collection of autographs, from Mr. H. Campkin, ; a memorial of Shakspeare, carved from Herne's oak and an apple-tree in Anne Hathaway's garden, from Messrs. Rogers; specimens of Japanese ivory ware and Russian goldsmith's work, from Messrs. Phillips; several busts, from T. Butler, Esq., sculptor of the marble bust of Jacob Bell; some statuettes and busts, from Mr. Claudet, illustrating an ingenious application of photography which has been recently made in Paris, and to which the name of Photosculpture has been applied by M. Willème, its inventor. By this process, busts and statues of living persons are prepared in plaster and "biscuit," which possess much of that faithfulness and minute accuracy of detail which are so striking in photographic portraits. The principle of the new art is easily explained. The person whose bust or statue is to be taken is placed in the centre of a circular apartment forty feet in diameter, and twenty-four cameræ obscuræ are placed along the wall at equal distances from him and from each other. By means of a latch, which raises and drops the slides at the same moment, twenty-four photographs are taken at the same instant of the sitter. He is thus represented from twenty-four points of view. There are of course six front views, six back views, and twelve side views, so that a clever artist would find in these photographs all the materials for a piece of sculpture to be fashioned by the eye. But this is not the course taken, mechanical processes being adopted which ensure much greater accuracy. The negative of one of the portraits is placed in a magic lantern, and the image printed upon it is projected on a large sheet of rough glass. The block of clay in which the model is to be cut is then placed on a revolving stand, the circumference of which is divided into twenty-four parts. A pantograph is next employed, by which the clay is cut exactly to represent the outline on the glass. When one photograph has been copied, the image of the next is placed in the lantern, and the clay is turned round one twenty-fourth part of a circle. It is then copied, and so on with the twenty-four negatives. The result is that the block of clay exhibits twenty-four sides, or facets, representing exactly the outlines of the twenty-four photographs. Of course there are ridges left which must be smoothed down, and this process is entrusted to skilful artists. Several flint implements from Abbeville and St. Acheul, Amiens, from John Evans, Esq.; a

collection of antiquities from Wycombe, Gloucestershire, from B. Vincent, Esq.; bronzes, from Mr. E. Bremridge; and Majolica ware, from Messrs. Phillips.

A gorilla (by permission of the Anthropological Society), some elephants' bones, and two elephant's tusks, one healthy, the other diseased, both from the same animal, were contributed by Mr. Leadbeater; the head of a New Zealander, by Mr. R. Morson; a case of insects, by Mr. Larkin. A large collection of medical and economic plants, from the Royal Botanic Society's Gardens, Regent's Park; amongst other plants of interest were the May Apple (*Podophyllum peltatum*), Squill (*Urginea Scilla*), Black Pepper (*Piper nigrum*), Cassia (*Cinnamomum Cassia*), Camphor (*Camphora officinarum*), Matico (*Artanthe elongata*), Cassava (*Manihot utilissima*), Papyrus (*Papyrus antiquorum*), Castor Oil (*Ricinus communis*), Cocoa (*Theobroma Cacao*), Rice (*Oryza sativa*), Oil Palm (*Elæis Guineensis*), Allspice (*Eugenia Pimenta*), Olive (*Olea europæa*), Arrowroot (*Maranta arundinacea*), Indigo (*Indigofera tinctoria*), Coffee (*Coffea arabica*), Nutmeg (*Myristica moschata*), Guaiacum (*Guaiacum officinale*), etc. etc., by Professor Bentley; some rare dried specimens of *Myroxylon peruiferum* and *Myroxylon Pereiræ*, by Mr. Daniel Hanbury, who also exhibited dried specimens of *Ceratonia siliqua*, *Cassia moschata*, and *Cassia brasiliana*, drawings of earthen jars in which balsam of Peru was formerly contained, and of the gourds, etc., in which it is now put, with other highly interesting specimens connected with the extraction, collection, and preservation of balsams of Peru and Tolu; an interesting collection of Upas poisons, including specimens of the leaves and wood of the tree, whence obtained, and poisons from various localities, with poisoned and non-envenomed arrows, by M. C. Cooke, Esq.; podophyllum resin, by Mr. T. N. R. Morson; specimen of ricinine, an alkaloid obtained from castor-oil seeds, by Professor Tuson; a part of the first keg of iodine manufactured by the British Seaweed Company under the patented process of Mr. E. C. C. Stanford, late Demonstrator in the laboratories of the Pharmaceutical Society, by Mr. T. N. R. Morson; a fine specimen of crystallized citrate of lithia, by Messrs. Blake, Sandford, and Blake; a case of thallium and its salts (by permission of W. Crookes, Esq.), by Messrs. Hopkin and Williams; a collection of minerals, by Mr. B. M. Wright; and some fossils from the lias near Lyme Regis, and a case of emeralds, opals, etc. etc., by Mr. J. R. Gregory.

Wheatstone's printing telegraphs, from Professor Wheatstone, was shown in action; experiments for rendering the vibrations of plates of glass and metal visible by means of sand, also experiments for illustrating the production of sound, were shown by Mr. Ladd, who also exhibited some optical experiments during the evening; a self-acting washing-cradle for washing photographic prints (invented by Cornelius Hanbury, Esq.) was contributed by Mr. Wood, of Cheapside: in this apparatus the mechanical force of the water is made to fill the vessel, empty it, drain the prints, fill it again, and so on until sufficient washing has been effected, the advantages being that it requires no attention on the part of the operator, and it economizes both time and water; a working model of Joy's double-acting and self-acting steam-hammer was exhibited by Messrs. Tregelles and Taylor; a dry voltaic pile, which has been causing the vibration of a disk of paper between its poles for thirty-six years, was shown by Mr. Noakes; a working model of the semaphore of the Patent Electric Signal Company, from the Company, was shown in action by Mr. Silver: in this instance, the well-known power which heat has in causing the curvature of a compound metallic bar is ingeniously made use of in ringing an alarm bell in case the light in the lantern is extinguished; Messrs. Rennie contributed a model of a floating-dock constructed for the Spanish Government at Carthagena, and some models of double-screw gunboats. Mr. How, who also showed an improved photographic tent, exhibited an electro-magnetic engine in motion; Mr. J. Imray exhibited his electric safety distance signal in action: by means of this invention, which is

in use on the London, Chatham, and Dover Railway, a signal may be turned by means of electricity, and at any distance from the operator. In addition to these, there was a specimen of submarine cable, with polypi formations, from Mr. Fleeming Jenkin; magnetic dial instruments and specimens of submarine telegraph cables, from Messrs. Siemens, Halske, and Co.; a printing telegraph, Morse's apparatus, Ragon's bell, pneumatic relay, various telegraph insulators, mounted, Silver's improved voltaic battery, and a collection of articles in ebonite, from Messrs. Silver and Co.; a set of metrical weights and measures, from James Yates, Esq.; air-pumps and chemical apparatus from Mr. Griffin; models of crystals, from Mr. Larkin; a curious doctor's bill of the eighteenth century, from Mr. Willows; photographs, from the Royal Exchange Portrait Company; improved oxygen inhaler and apparatus, from Mr. Robbins; an apparatus for condensed oxygen, from Mr. Barth; poison bottles, from Mr. Toogood, and Godfrey's poison bottles, from Mr. Underhill; air filters and ventilating apparatus, from Mr. Boyle; and a large show of microscopes, etc., from Messrs. Ross, Smith and Beck, Murray and Heath, Carpenter and Westley, How, Highley, and Shuter.

During the evening Professor Abel delivered a very interesting and important lecture to a crowded audience in the lecture theatre; the lecturer demonstrated by some interesting experiments the applicability of gun cotton to the purposes for which gunpowder is now used, and from which it appeared that the great objections which used to be urged against the use of gun cotton as an explosive material have been overcome, partly by the improved process of manufacture and partly by using it in a plaited or woven state. A photograph was taken by the magnesium light by Mr. Claudet. The apparatus used in the testing of gas was shown and illustrated by experiment by Mr. C. H. Wood. Experiments on diffraction of light were shown by Messrs. Horne, Thornthwaite, and Co.; and experiments on hydrogen flame were shown by Mr. Broughton.

There was also a collection of percolators from Mr. Haselden, Mr. Gilbertson, the York Glass Company; Sanger's percolator, from Mr. Toogood; and Dr. Redwood's automatic displacement apparatus, from Mr. Coffey. A mechanical stirrer in action was also shown by Mr. T. B. Redwood.

THE TWENTY-THIRD ANNIVERSARY MEETING OF THE PHARMACEUTICAL SOCIETY.

Wednesday, May 18th, 1864.

MR. G. W. SANDFORD, PRESIDENT, IN THE CHAIR.

The PRESIDENT opened the Meeting with the following Address:—

Gentlemen,—Twenty-three years ago the chemists and druggists of this kingdom formed themselves into a Society for the advancement of pharmacy by the education and protection of those who should practise it. Annually since that period they have met together under this roof to review their progress, and renew their pledge of union. To-day I think we may regard our position with no little satisfaction; we may think of the want of union which had previously existed, of the various individual interests which served rather to keep men apart, as difficulties surmounted, and regard the Pharmaceutical Society of Great Britain at this moment as a compact and powerful body corporate, united in itself, acknowledged and respected by others as a national institution. But although these difficulties have been surmounted, you must forgive me for recalling them to your recollection; it seems to me wise that we should always regard them as opposing forces to our progress, kept in abeyance only by our own heartiness in the cause we have undertaken. Our success is due, gentlemen, mainly to perseverance in the course laid down by those honoured men who laboured so earnestly

in our foundation; who saw at once that to maintain union we must avoid all interference with matters of trade, to obtain respect we must work simultaneously for the public benefit as well as our own.

I trust hereafter 1864 will be regarded as an epoch in the annals of our Society. I may perhaps be too sanguine, but I must confess that to me the attainment of the great object for which we have so long worked seems now to be more nearly within reach than at any previous time of our existence. Various circumstances have combined to forward our views; it is for us to apply them. In 1841, it was asserted by a few that the public safety required a class of specially educated men for the dispensing of medicines; but the dispensers themselves had no central board to which could be entrusted the power of determining the nature and extent of the necessary qualification, or the responsibility of ascertaining whether or no a man, desiring to commence business as a dispenser, possessed it. It was therefore proposed to put us under the control of an authority having at that time little sympathy, and perhaps nothing in common with us. To this we objected, not to the principle enunciated, but to the means of carrying it into operation. Recognizing the necessity for qualification, we at once set to work to supply the want. There was then no public school of pharmacy; we formed one. There was no organized union of chemists and druggists to serve as a starting-point; we formed a Society, on as broad a basis as might be, by uniting all worthy men then in the business who chose to come in, but fixing an educational test for all future members. Here then was the beginning of a Board of Examiners, formed of men *in* the trade, who could best judge of the requirements *of* the trade. And up to 1852, we worked this machinery on the *purely voluntary* principle. Then we obtained—not all we wanted, but an instalment,—a Parliamentary recognition of the principle we had adopted, and the means we had devised for its promotion. Our examination was made compulsory on those who chose to assume a certain title, but not on all who practised pharmacy. We had passed ten years of probation, and then received limited powers from the Legislature. And, Gentlemen, our exercise of those powers since 1852 has placed us in the position we enjoy now,—the one recognized *Board of Pharmacy of Great Britain*, approved and aided by the higher branches of the medical profession, encouraged and consulted by various departments of the government, and now becoming generally known and appreciated by the public. The Medical Council see that pharmacy is a branch of their profession, that it is desirable that the dispensing of prescriptions should be confined to qualified persons, and that our Board of Examiners provides a means of testing that qualification.

I need scarcely remind you that in the amendments which were proposed in the Medical Act, due regard was given to the Pharmaceutical Society. We have been charged with coquetting with the Medical Council in this matter, *because our own position was safe*. In reply, I am not ashamed to say that I do regard this placing of the Pharmaceutical Chemists, who have, as a class, been created by us, as a matter of *great congratulation*, a testimony to the efficiency of our system and a fair acknowledgment of our labour; but I entirely deny that this Society had any share in the proposition of the committee of the Medical Council. There were points in that proposition to which we could never have assented. It has been abandoned, but gathering the opinion of that Council, as we can now do by the publication of their debates, I believe the question is only in abeyance, that if *we* do not forestal them they will ultimately proceed to legislation; and in that case, seeing the object is to secure the one thing for which our Society was established and has ever worked, however much we might feel it our duty to modify their details, we could not oppose their principle. I am confirmed in my opinion that this question is only postponed, by an extract from the Minutes of the Medical Council, of May 7th, the last day of their session:—

Moved by Dr. CORRIGAN, seconded by Dr. QUAIN, and agreed to:—"That a communication be addressed to the Secretary of State for the Home Department, drawing his attention to the present defective state of the law regarding the Practice of Pharmacy, under which any person, however ignorant, may undertake it; and expressing the opinion of the General Medical Council, that some legislative enactment is urgently called for to ensure competency in persons keeping open shops for dispensing medicines and for the compounding of Physicians' and Surgeons' prescriptions."

Gentlemen, I believe the greatest mistake we could possibly commit would be to treat the Medical Council with distrust. I think they would gladly see us obtain power for the regulation of pharmaceutists entirely independent of their Board, and I know no men who could give us more effectual aid in obtaining those powers. I will not prejudge questions which are to come under your consideration this morning; they will require, and I am sure receive, very calm thought. It is an old saying, that every question has two sides, and ours is no exception to the general rule. Standing with our own position assured, we are, as it were, between two parties: one, which I have mentioned, may be supposed to speak with great authority, and its opinion is entitled to all respect; the other, our brethren in the trade, who ought to be with us in the advancement of a work which is as much, or indeed more, for their benefit than our own; and now by a union of the whole we seem to have the opportunity of elevating the position of Chemists and Druggists as a class, and yet (by promoting what might at first sight seem to be a *class interest*) adding to the general welfare and security of the Public.

The "Annual Meeting" of this Society is not called for scientific discussion, but some of my predecessors in this chair—who have filled it much more ably than I do—have on these occasions taken some note of the progress of pharmacy. I have to-day regarded the *business* of the Society as for the moment of such absorbing interest to us all, that I have confined my remarks to that point; not that we can ever separate the progress of pharmacy from that of pharmaceutists, the two are so intimately associated that what advances one promotes the other. But it may have been thought that I should have found some cause for congratulation, and some evidence of the fruition of the seed sown during the last twenty years, in the establishment since our last meeting, by gentlemen who I think look up to the Pharmaceutical Society as their "Alma Mater," of a Conference for the exclusive discussion of scientific matters of pharmaceutical interest. Some mention may have been expected, too, of the issue of a new Pharmacopœia; that at least is an event which must interest us all, the more especially as it has been issued from a new source, and is the first in the formation of which Pharmaceutical Chemists have been asked directly to assist. Gentlemen, we all know to how much discussion that book has given rise, and if it has not been the *best studied*, it certainly has been the *best abused* book which has appeared for many a day. It seems to have been somewhat the fashion of critics to dwell on its weak points, but they have told us also that it contains many improvements on former Pharmacopœias, and at least it possesses the one merit of having brought England, Ireland, and Scotland into union on a most important point.

Gentlemen, these criticisms have proceeded from various quarters, some of them from men so high in authority that the adoption or non-adoption of the British Pharmacopœia by pharmaceutists has been a difficult question, and it is therefore satisfactory to find that even the Medical Council themselves have felt the difficulty, and appointed a Committee, consisting of Dr. Christison, Dr. Sharpey, Dr. Apjohn, and Dr. Quain, "for preparing the next edition of the British Pharmacopœia;" under their guidance, "an Editor or Editors will be appointed." As we have been told that in many of the new forms a sort of *compromise* had to be effected between London, Edinburgh, and Dublin, we may perhaps hope that this lessening of the number of champions from each city may facilitate the work.

There is one thing which I cannot forbear mentioning, namely that a recommendation appeared in a report of the Medical Council last June, that a permanent Committee should be appointed to take note of the improvements in medicine and pharmacy, and from time to time introduce them by authority to the medical profession at large; this is important, and it more immediately concerns us to find, "that it should be an instruction to these gentlemen to invite information as to improvements in the Pharmacopœia from the medical, surgical, *and pharmaceutical* bodies of the several divisions of the country."

And now I will not detain you longer from the business of the morning; our Secretary is prepared to read to you the report of the Council on the past year; there is work to be done, and I trust, remembering that even a good cause cannot conquer without union on the part of its advocates, we shall proceed to that work as one man.

The Secretary then read the

REPORT OF THE COUNCIL.

FINANCIAL STATEMENT—*From 1st January to 31st December*, 1863.

RECEIPTS.	£.	s.	d.	£.	s.	d.
Balance in Treasurer's hands				263	16	8
,, Secretary's hands				2	4	9
Benevolent Fund:						
Subscriptions	78	18	6			
Donations	128	3	0			
Interest	109	2	11			
				376	4	5
Life Members' Fund:						
21 Life Members' fees	£110	5	0			
Interest	63	3	1			
				173	8	1
Government Securities:						
Interest				29	0	0
Rent				83	10	0
Fees:						
Lecture				122	6	6
Laboratory				399	14	0
Registrar:—						
36 Pharmaceutical Chemists	216	6	0			
44 Assistants	184	16	0			
73 Apprentices	153	6	0			
106 Registration Certificates	5	6	0			
				559	14	0
Donation to the Society				1	1	0
Subscriptions:						
349 London Members	366	9	0			
1432 Country Members	1503	12	0			
93 Associates	48	16	6			
66 Apprentices	34	13	0			
				1953	10	6
Arrears of Subscription				96	17	6
Balance due to Secretary				5	5	1
				£4086	12	6

EXPENDITURE.	£.	s.	d.	£.	s.	d.
Benevolent Fund:						
Relief granted	£90	0	0			
Investment	286	4	5			
				376	4	5
Life Members' Fund:						
Investment				110	5	0
Conversazione	66	19	4¼			
Pharmaceutical Meetings	4	16	9½			
Sundries	2	0	4			
Repayments of Subscriptions in excess	6	6	11			
				80	3	5
House Expenses				22	2	9½
Rent, Rates, Taxes, and Insurance				437	11	0
Repairs and Alterations				154	10	11
Fixtures and Fittings				55	11	7
Apparatus				9	10	0
Library				61	13	3
Museum				0	6	0
Furniture				3	11	2½
Stationery				9	4	3½
Postage				62	6	5
Printing and Engraving				91	10	3
Advertisements				56	8	6
Journals, balance of Account				70	7	5
Carriage				2	15	1
Collector's Commission				27	7	5
Travelling Expenses				122	9	8
Salary to Secretary				276	11	0
Wages				161	6	6
Expenses of Society in Scotland				64	15	6
Board of Examiners				68	5	0
Professor of Chemistry and Pharmacy, including duties as Curator, etc.				300	0	0
Professor of Botany and Materia Medica, including duties as Curator, etc.				250	0	0
Subscription to Royal Botanic Gardens				21	0	0
Prize Medals, etc.				7	14	0
Laboratory:						
Director's Salary and Percentage on Fees	316	0	0			
Demonstrator	50	0	0			
Porter's wages	47	2	0			
Chemicals, etc.	137	15	6½			
				550	17	6½
Law Costs				188	17	5
Balance in Treasurer's hands				443	6	11
				£4086	12	6

We, the undersigned Auditors, have examined the Accounts of the Pharmaceutical Society, and find them correct agreeably with the foregoing statement, and that, as shown by the Books of the Society, there was standing in the names of the Trustees of the Society, at the Bank of England, on the 31st of December, 1863:—

	£	s.	d.
On Account of the General Fund, New 3 per Cents	£1000	0	0
Life Members' Fund, 3 per Cent. Consols	2475	12	2
Benevolent Fund, 3 per Cent. Consols	6182	19	10

FREDERICK BARRON,
JOHN CARR,
CHARLES DAVY,
WILLIAM McCULLOCH,
BENJAMIN YATES,
} Auditors.

February 25th, 1864.

The foregoing statement offers no salient point for remark on the part of the Council, but it will nevertheless be found, on analysis, to afford satisfactory evidence as to the financial condition of the Society, inasmuch as almost every item on the credit side is somewhat higher, and most of the charges "per contra" a little lower, than in the account, rendered at our last Annual Meeting, of the receipts and disbursements of 1862. The two sides are alike important; from the one we estimate the interest taken by members and associates in supporting the Society, from the other the care bestowed by the Council in the management of its affairs. The number of those who have joined the Society during the past year, has been sufficient to compensate for the unavoidable decrease by death and other causes. Reading upwards in our balance-sheet, and comparing it with 1862, we find the registration fees of the former year to be—pharmaceutical chemists, 30; assistants, 34; apprentices, 68; against 36, 44, and 73 in 1863. In the lecture and laboratory fees some improvement is apparent, and in the Benevolent Fund a marked increase has taken place.

There is one source of income which has improved of late, and which is worthy of remark—the *arrears of subscription*. Our account terminates at Christmas, 1863, but we may be permitted to state that since that time a much larger sum has been received on this head than during the whole of the former year; and we mention this to show that men who had joined the Society in the enthusiasm of its early days, and then fallen away, must have found a satisfactory answer to the "*cui bono*" of our opponents and lukewarm supporters.

Last year we had the satisfaction of drawing attention to the great diminution of expense in the publication of the 'Pharmaceutical Journal and Transactions,' and now we show that improvement not only to have been kept up, but even to have been increased by another hundred pounds, and that too, without deterioration of the work.

Although there is an increase in the number of pupils in the laboratory, the Council cannot but feel disappointed regarding it. When, by the aid of the munificent legacy from the late Mr. Bell, it was deemed wise to remove the students from the ill-ventilated and insufficient laboratory in the basement to a more commodious one at the top of the house, a confident expectation was entertained that the improved accommodation would bring together a much larger class. In this department no pains have been spared. An excellent Director is in charge, aided by a competent Demonstrator; but up to this time the anticipations of the Council have not been fully realized. It is true that the funds of the Society cannot be more wisely spent than in promoting education, and that the difference between the receipts and disbursements of the laboratory is not very large (about £160); but the Council

had reason to hope, from the number of students of some former years, that the Society would have been quite free from pecuniary loss. While, however, expressing this disappointment, the important results of the instruction afforded by the Society must not be overlooked or undervalued. If the number of those who have availed themselves of the school be below the desired standard, the qualification has assuredly been up to it, and our laboratory pupils are spread abroad throughout the country, giving tone to the trade.

The Morning Lectures of the Professors continue to attract good classes; and the Evening Meetings for the discussion of matters of pharmaceutical interest were never better attended than they have been during the past session. Many important questions have been discussed, and whether regarded as opportunities for improvement by an interchange of ideas, or as tending to promote good feeling among us, these meetings are undoubtedly important and worthy of all support. The British Pharmacopœia naturally affords many subjects of interest; and at the request of the Council, our Professors, Redwood and Bentley, as well as Dr. Attfield, have each kindly given lectures upon it. The very full attendance at these lectures is evidence that they were well appreciated by our Members and Associates.

Within the year a slight modification has been made regarding the Bell Scholarships. By the original arrangement, one was to be given as a Minor and one as a Major; by this means the founders sought to encourage two classes: first, those who in an apprenticeship had given evidence of ability and a love of their profession; and secondly, those superior men who might be led to take a higher position in the world of science. The same regulations are still in force, but the latter class of scholars rarely arise, and in 1862–63 the Major scholarship was not awarded, or even applied for; consequently the Council decided that in the event of no candidate appearing for, or being found worthy of, one or other of the scholarships, two in one class might be given. Two Minor scholarships were thus given at the commencement of the present session.

Certain questions affecting the general well-being of the trade have engaged the attention of the Council. In the inability to obtain any remedy for the methylated spirit grievance from the Board of Inland Revenue, an appeal was made to the medical authorities of the various hospitals and dispensaries throughout the kingdom to discountenance as far as possible the use of this spirit in medicine. At our last meeting Mr. Paull's Bill for the Prevention of Bird-killing was under consideration of Parliament, and it became necessary to watch its progress narrowly; for going considerably beyond its original purposes, it assumed the features of a general Poison Bill, and that too, of a very objectionable character. Earnest representations were made to the framers of the Bill and other members of the House of Commons, and ultimately it was reduced to an unobjectionable measure, and passed.

At the end of June, "A Bill for the Prevention of Accidental Poisoning" was introduced by Lord Raynham; it was extremely short, but long enough to contain provisions which would have been utterly impracticable, and was rejected when brought up for second reading.

Mr. Ewart's Bill to introduce the Decimal and Metrical system of weights and measures into England was considered of sufficient importance to call for a Special General Meeting of our Society; a petition in its favour was presented to Parliament. The Bill passed a second reading, but was not proceeded with; it has been renewed in a modified form this Session, and will, if carried, render the use of the system permissive. A much more important question arose on the issue of a Report of a Committee of the General Medical Council in the shape of an Amended Medical Act, which proposed to bring Pharmacy within the scope of the Medical Council, and chemists and druggists

under their control. This Act recognized the Board of Examiners of the Pharmaceutical Society, and proposed to take their certificate as evidence of qualification. The Council of this Society felt confident that the clauses which created so much alarm in the minds of chemists and druggists would never pass as they stood in the Bill, at the same time they kept a steady eye on the progress of events. The Medical Council have for the present relinquished the proposition; but it may nevertheless ultimately prove to have given rise to great changes in our business, for we must regard it as the immediate cause of the agitation now going on in and out of our Society for legislative power to compel the examination of every man who shall in future commence business as a dispensing chemist.

It is almost needless to recapitulate the steps which have been taken with regard to an extension of the Pharmacy Act. The Special General Meeting of the Society is yet fresh in our memory; the Bill drawn by the solicitors under the instruction of the Council is before every member in his Journal of the present month, which also contains an intimation that its consideration will form part of this day's proceedings.

The arrangements brought into operation last year for the appointment of Local Secretaries seem to work satisfactorily. It is of great importance that the interests of the Society should be carefully watched in the Provinces, and there is much in the power of these gentlemen which may advance its progress; the Benevolent Fund too, might be (and in some cases has been) considerably augmented by their exertions. At this moment, when the Society meditates applying to Parliament for an extension of its powers, which, if granted, will go far to consummate the labour of nearly a quarter of a century, the cordial co-operation of all its members is of vital importance, and can be best secured by the representatives of the Council throughout the kingdom.

This Report, in its commencement, speaks of the increased contributions to the Benevolent Fund, but it cannot close without specially drawing attention to the necessity of further support. It will be remembered that in the last two Reports attention was directed, first, to the rules for its distribution, and afterwards to the desirability of establishing pensions as well as temporary relief: the demand for the former appears to have arisen, as indeed it might fairly be expected to arise, with the advancing age of the Society. The Council has taken advantage of the present appeal to Parliament to obtain some extension of its powers in the administration of this fund. Under the Charter, relief can be granted only to such as are actually connected with the Society at the time of application, or to the widows or orphans of men who were so connected up to the time of their decease; but it will be easily understood that a member when falling into straitened circumstances, will often (unwise though it may be) endeavour to curtail his expenses by such means as are least likely to indicate his real position to his neighbours, and retirement from a voluntary society may seem to be one of them. In practice the Council has actually found this to be the case, and felt it painful to be unable to afford aid where it was much needed.

The Council cannot take leave of the Society at the conclusion of their year of office without paying a tribute of respect to one who was for a long period their very zealous and faithful colleague—Mr. Bucklee, of whose assistance they were deprived by death in October last.

Mr. Orridge moved that the Report and Treasurer's Account be received, adopted. and printed in the Transactions of the Society. As the important business of the meeting had reference to the proposed new Pharmacy Bill, and would occupy considerable time, he should be brief in what he had to say with regard to the Report. He thought the Council had scarcely done the professors sufficient justice, when it was remembered

how highly the medical journals and medical men spoke of the learning and ability displayed by them in the lectures which they delivered on the Pharmacopœia, and which had the effect of materially enhancing the value of the Society in their estimation. He regretted it had not been possible to delay the Report for a week, because in all probability the Council would then have referred to the Lord Chancellor's Small Debts Bill. Few chemists' bills amounted to more than £20, and to deprive a man of the power of suing after twelve months was something like confiscation; and he thought the argument used in favour of that proposition absurd, viz. that because some artisans' wives improperly and recklessly involved their husbands with the tallyman, that therefore the book debts of honest tradesmen should not be recoverable after twelve months.

The PRESIDENT said he believed a remonstrance would be laid before the Lord Chancellor with reference to that part of the Bill.

Mr. HOLLIER seconded the motion. That part of the Report which bore on the Amended Pharmacy Act he considered very important. He wished the Local Secretaries had taken more action in reference to it, because he believed that if they had shown a more leading spirit on the point they would have obtained in a great degree the support and approval of the chemists and druggists generally, as well as Pharmaceutical Chemists. He was able to speak with more confidence on that point from his own experience in the district where he resided. He approved also of that portion of the Report which alluded to the Benevolent Fund.

The motion was then agreed to unanimously.

The PRESIDENT said they had arrived at the most important business in connection with the meeting, viz. the consideration of the new Pharmacy Bill, which having been published in that month's Journal might be taken as having been read.

Mr. GEORGE EDWARDS said: I have had a weighty task committed to me, to commend to your acceptance the Bill which has been placed before you. It was only at the Council Meeting this morning that this duty was allotted to me; if I had had longer notice I would have endeavoured to prepare myself better to discharge it, and to have arranged with greater clearness and order that which I wished to say to you; and as I expected rather to reply to some of the objections which I knew would be made to it than to descant upon its merits, if what I say should seem to bear this character I must beg you to hear me with indulgence. I am consoled by the reflection that if I cannot adequately recommend it I can call with confidence upon another advocate; the Bill shall speak for itself, and when I see how it has gained approbation on every hand, I am ready to believe that it will be successful with you. If you will look at the existing Pharmacy Act you will see it declared in the preamble, that it was desirable that every person who should be entrusted with the compounding and dispensing of medicines should be examined, and it declared also that the title of Pharmaceutical Chemist should set forth to all the world that the man that bore it might be depended upon as one who had proved himself by examination an educated and trustworthy man. It refused to limit the right which every man possesses to deal with whom he chooses, but it resolved to point out the person who may be safely trusted, and then leave every one to act as he thought best. Now this was the avowed purpose of the Legislature; *we* might have other objects in view, but this was the sole purpose of the Legislature, and to this there was but one exception; they said, "You, Members of the Pharmaceutical Society who have laboured for this, who have with much cost and pains set on foot a wise system of education to accomplish it, and without whose efforts this desirable step would never have been taken,—as your reward you shall be entitled to assume without further examination this title of honour. And now we commit this Bill to you to be carried out in the spirit in which it is enacted." We have done this for the last twelve years: hundreds have passed our examinations, they have won the approbation of the Legislature, the Government has opened its appointments to those who have our certificates, they have the confidence of the medical profession, and the public are steadily learning to appreciate the title of Pharmaceutical Chemist, and we occupy the place of respect and influence which belongs to us to-day. And now we are called upon to take another step and provide a measure for the satisfactory regulation of pharmacy in this country for the future, and in doing this we must remember that we have the interests of two great classes to regard; on the one hand there are the public, the Government, and the medical profession, who look to us to maintain the objects for which they have trusted us, and on the other, the whole body of chemists throughout the country who are not our

members, but who claim to have their existing interests preserved uninjured. Now, Gentlemen, it is very probable that in attending to both we shall fully please neither of them, each will think we have not done quite as well as we might have done, the *via media* may not meet with universal approbation; we must expect this, and be content to bear it; but nevertheless our duty is clear, and we must endeavour to the utmost of our power to do that which shall be right and just. With regard to the latter class, then, we propose to register every man who can make any reasonable claim to be considered a chemist, and preserve to him, in full, every privilege and right that he at present possesses. More than this surely we cannot be expected to do; it cannot be claimed that we shall grant privileges. The title of Pharmaceutical Chemist is a mark of distinction which is no part of the existing rights of the chemist and druggist. If it be said that they should have a voice in the Society by which they are governed, the reply is that they are not governed in any way. The Society does not control them or regulate their business in any way, and cannot do so, under the projected Act. It registers them, and thus preserves every right to them, and then shakes hands and has no more to do with them unless they wish it; you do not in any way govern them, and surely they cannot claim to govern *you*. It cannot be allowed that they should guide the affairs of a society of which they are not members, and to whose advancement they have never contributed a shilling. And then to give them the title and privileges of Pharmaceutical Chemists would be to break faith with the other class; the Government and medical profession and the public would say, "You had this trust committed to you twelve years ago, in the belief that you would faithfully use it to train up a class of men who should be fully qualified for their duties; and believing that you were doing this, we have honoured and trusted you, and now you gravely purpose to deceive us all, and while we declare that the present state of pharmacy is disgraceful to the country, to admit all these men to your highest honours, and actually to dignify them with your scientific title. How can we think but with contempt of such a proceeding as this?" But I may be told that it is not intended to recommend that *all* shall be so admitted, but only the best of them, such as shall convince the Council that they are fit for admission. I reply, that every one who has had any experience will know that such selection is utterly impracticable. The difference between the most suitable man and the most unsuitable shades off by such imperceptible degrees that no line of division can be drawn; there would be constantly discussion and division in the Council itself as to the propriety of admitting one and another, and without some test, such as examination, it would practically be impossible to refuse any application that came before you. And I will go further, and say that I believe the Courts of Law would not allow you to do so, on no better grounds than your *opinion* that a man was unfit. It does not matter so long as it is merely an honour, and a voluntary society; but it will be quite a different thing when a man's living depends upon it. Take, for example, a town where there may be five chemists, and four are thus admitted and one refused. The rejected one would say, "Why do you refuse me the distinction which my neighbour possesses, and thus injure materially my business? Is it because my shop is not so handsome? What has that to do with it? Is it because I sell paint and oils? So does my neighbour. Is it because I am not so educated? How do you know this? you have never examined us, and if you had, you might perhaps have found that I was the better of the two. And what right have you, without examination, to say this?" And in spite of all your care you would find some man whom you had admitted whose case could not be distinguished from the man whom you had rejected; and without some test, such as examination, you would find it practically impossible to reject any one whose shop displayed a blue and yellow bottle. It is said that if we refuse this we shall meet with formidable opposition. I hold the opposition cheaply. I think we *may* meet with formidable opposition, but not from the quarter where it is threatened. The opposition I fear is from the Legislature. You are about to introduce a new principle into commercial law. Hitherto any man in England might set up in any trade he thought right, and, however unqualified he might be, if people liked to deal with him, he might carry on his trade. You and I may set up as watchmakers, or jewellers, or any trade we please, without knowing anything about the business; and more than that, we may act as physicians or surgeons (so that we do not take the name), and have the lives of our fellow-creatures in our hands, if they like to entrust them to us. I know that we cannot enforce our debts for such attendance, in law, but if we like to trust to the honour of those who employ us, there is nothing to

hinder us from doing so. A case occurred not many days ago, when an agent of Dr. Coffin was prosecuted for manslaughter, and the judge laid down the law, that every man, educated or not, might administer medicine at the same risk, and if it could be proved that ignorantly he had given that which had done mischief, he must bear the consequence,—medical or non-medical, the law was alike to all. But now you seek to introduce a new principle, and say that a man shall *not* keep open shop for the compounding of prescriptions, whether persons choose to employ him or no, unless he has been examined. This may meet with formidable opposition, but the other you need not fear. But if it prove otherwise, and we fail—then fail, Gentlemen. Failure in support of the principles you are pledged to, of the interests of those whom you are bound to take care of, of those who now for twelve years have given their time and their money and their study in your school and laboratory, to fit themselves for that examination which the law required, and without which they were led to believe they could not attain honourable rank in their profession,—failure in support of this is more honourable than success would be at the price of abandoning it all. I, for one, would rather see the Society decay than consent to what would be so unworthy. I would borrow the words of Grattan about Irish independence, and say, "I have rocked its cradle, and stood by its grave." But you will not fail; you have the respect of the Government, the support of the Medical Council, the confidence of the medical profession, and, I believe, the approbation of the great majority of the reflecting men both in and out of the Society; and unless you are prepared to give up all this, I urge you, by all the efforts you have made, by the money you have spent in the promotion of those purposes that called you into being as a Society, by the interests of those who look up to you, and the honourable position you have attained,—I conjure you, by the toils and exertions of the living, and by the memory of the dead (for his bust is there), to receive and adopt this Bill.

Mr. Mackay seconded Mr. Edwards's motion, that "this Bill be received and adopted," and in doing so said he had to throw himself on the indulgence of the Meeting, in consequence of his having to follow immediately after the able and masterly speech ddelivered by Mr. Edwards, who had gone so fully into the subject as to leave him little to add to it. He cordially and heartily supported the motion, and he agreed in all that Mr. Edwards had said. There was, however, one point which Mr. Edwards had passed over that he would allude to. He wished to be as liberal as he possibly could to all those outside the Society, and when it was said they wished by this Bill to exclude all the present outsiders from enjoying all the existing rights and privileges of the Society, he emphatically denied it, because provision was made for registration, and by their passing a Minor examination, they would be entitled to a vote in the government of the Society and to the name of Associate of the Pharmaceutical Society. He should be ashamed of the Society, and equally so of the Legislature of the country, were they to cause a Bill to be passed that would admit every chemist and druggist indiscriminately to the rights and privileges of the Society. It had been remarked that the Local Committees had failed to ascertain what was the feeling of the chemists and druggists in their respective neighbourhoods with regard to this Bill. Now he was happy to be able to state that at their annual meeting in Edinburgh a resolution was passed in which they agreed to support the Bill in every shape and way, and he hoped there were other Local Secretaries who were prepared to make a similar statement.

Mr. Collins said that after Mr. Edwards's speech, he had very great misgivings as to his being the proper person selected to move an addition to the motion before the Meeting, but he was encouraged in the hope that he should have Mr. Edwards's support, because what he proposed was an echo of a resolution Mr. Edwards proposed twelve years ago, and which he then seconded, and therefore, upon the principle that "One good turn deserves another," he hoped he should have Mr. Edwards's support. If they were the tribunal who had to pass the Bill, the arguments used by Mr. Edwards would be most conclusive in its favour, but when they considered that the tribunal before which it had to go did not contain a single Pharmaceutical Chemist, or a chemist of any kind, but a body of men who would view the measure on grounds of general policy and expediency, the arguments which found favour in that Meeting, and were applauded to the echo, would have no effect in that other place. His friend (Mr. Edwards) assumed that all the members of the Pharmaceutical Society were educated men, but there were only between 400 and 500 examined men out of the 2000 members. There were several thousand outside men who were equally as well qualified as the 1500 men who had not passed an

examination, and they might very reasonably complain, and say "Why should you give a title to certain persons that you refuse to us?" That was a principle very well applied so long as they remained a voluntary society, but it would not do now that they were applying to Parliament for extended powers. It was all very well to say they left the outsiders in the same position as before; that was true; but they lifted themselves a little higher at the same time, and increased the distance between the two. It had been said by a great statesman that preference in some cases was persecution. They were creating a preference, and from its being sanctioned by law it would be regarded as persecution. In this matter they ought not so much to see what would please themselves, but consider how others would view it. There were four classes who would be affected by the proposed measure: firstly, the founders of the Society; secondly, the examined men; thirdly, the outsiders; and fourthly, the public. Now with regard to the first, the founders of the Society were not examined men, but a body of men who were driven by the aggressions from without to associate together for a common object, that of preventing the public from meddling injuriously with them. Since then several hundreds of men had been examined under the constitution by a properly appointed board of examiners. Those men possessed a certain intellectual qualification, but the majority of the members of the Society had no other claim on the Society than that they had spent so much money. He had been a member of the Society from the first, and it had cost him about £30, for which they had given him value received by protecting him from the aggression of pragmatical medical practitioners and others, by giving him the opportunity of receiving instruction in that building, and by supplying him with the Journal, which had given him great information on subjects connected with his trade. They also held their annual *soirée* where he might eat any amount of ices, and they gave him the opportunity of making occasionally some dull speeches within their walls. He looked upon it as money well spent and invested. The founders of the Society were admitted under the bye-laws, and he saw no objection to their admitting men equally well qualified with themselves in the same manner. With regard to the examined men, they no doubt stood rather higher than those he had alluded to. Fortunately for themselves they had attained a higher status, but they must not forget that they had been materially assisted to it by the founders of the Society, and what had been provided for them had not been provided from their own resources, but mainly from those of the Society. It was said that those gentlemen had a claim on the Society for protection that their honours should not be bartered or frittered away by others having some supposed advantage over them. It must, however, be borne in mind that there were more than eighty of the examined members who had signed a document affirming that broad principle. It was perfectly absurd to suppose that men could be kept down to certain standards. Some men possessed higher qualifications than others. Some men were and must be greater in intellect than the rest, and thus the best men of the Society became their intellectual leaders as a body; and therefore to suppose that by admitting respectable chemists and druggists to a participation in the advantages of the Society would be to reduce the value of their position, was absurd, because there must always be a difference between the man who became a member by examination and him who was simply so by enrolment. He did not consider, as many supposed, that the examined members would object to the outsiders standing between the wind and their nobility, because he gave them credit for greater liberality of feeling and sentiment. With regard to the public, it might be urged on their part that by admitting the outsiders the Society was palming on them an inferior article, that they were giving an outside polish, but deceiving them in fact. But if the public made use of that argument, the members of the Society should not. They had from time to time admitted persons on certificate as duly qualified and entitled to enjoy the privileges of the Society, and what he proposed to add to the motion before the Meeting was the same as that which was proposed some twelve or thirteen years ago by Mr. Edwards at a special meeting of the Society, held for the purpose of considering the provisions of the Pharmacy Act. By it he did not express more than an abstract opinion, and he had brought it forward on the grounds of policy and expediency. He doubted if the proposed application found favour with those unconnected with the Society. The members of the Legislature would be obliged to take a broad view of the question, and he was inclined to think the result would be that either they would not get the Bill, or if they did it would be with the introduction of a clause more favourable to the outsiders than the Society appeared disposed to accord to them. He therefore proposed the following addition to the motion.—

"That under an amended Pharmacy Act, it is desirable that the Pharmaceutical Society should include amongst its members, all duly qualified dispensing chemists throughout the United Kingdom, and that provision for the admission of such persons to membership should be made accordingly."

Mr. WAUGH. Will Mr. Collins add to it his definition of a duly qualified man? By so doing he will save the Council much time and considerable trouble.

Mr. COLLINS. It is very easy to point out certain persons.

Mr. WAUGH. It may be very easy to you, but I am afraid it will be very difficult for us to do so.

Mr. COLLINS said there could be no more difficulty about it now, than there was when Mr. Edwards brought it forward.

Mr. TUPHOLME seconded the amendment.

Mr. SAVAGE considered they were in rather an anomalous position. They were first told by the outsiders that they had no wish to be connected with the Society, and afterwards that they desired to be placed on an equality with the members, and to become equal participators in their rights and privileges. Now the question was what was to be the starting-point. He could not for a moment believe that Parliament would annul the power which they gave them twenty years ago, and begin *de novo*. The value of the Society was strikingly exemplified in the addition of twenty Members during the last twelve months, who had paid on an average of seven years, and of ten Associates on an average of ten years, so that if there were some outsiders who did not value the Society, there were others who were exceedingly jealous of its progress. He should be glad to see those who neglected their duty in 1852 admitted now, on the payment of the arrears of subscription, if it could be done without producing any great injustice. There must however, be a definite starting-point, or else they would not know when to stop; and he considered they would be doing a great injustice were they to add indiscriminately, with or without the test of examination, all those who had hitherto put every possible obstruction in their way. He believed they must have some broad and definite point to start from, because the examined men had a perfect right to ask for the Society's protection. The outside chemists and druggists who were making this commotion had in their organ pointed out eight specific objections to the measure. First, that an invidious distinction was sought to be perpetuated between equally qualified and respectable members of the trade. Now a distinction between them at present existed, and if the Pharmaceutical Society did not go to Parliament, the same distinction would continue to exist, and it was desirable that it should be perpetuated. Secondly, they said unlimited power was claimed by the Pharmaceutical Council to govern all future interests while refusing to give any voice or representation except by the degrading condition of passing the Minor examination. Now that was a most extraordinary sentence, and Mr. Edwards had told them it was no such thing, and that it was a great mistake for them to think so. Thirdly, they said there was a total absence of any provision for securing local government or local boards of examination, which, although simple and economical in their arrangement, would secure the practical knowledge required, and that the consequent retention of the present expensive and almost prohibitory form of examination of the Pharmaceutical Society would violate the first principle of commercial freedom, in placing unnecessary obstacles to public requirements. That he looked upon as a matter of detail which it was competent for the Council to deal with, and he for one should be very glad if the Council would take action in respect of it. and have local examinations in those districts remote from London. Fourthly, they said that danger would ensue to existing interests in subjecting the evidence of qualification and future government to the satisfaction of the registrar of the Pharmaceutical Society, without any appeal except to the Council. He should exceedingly regret if the Pharmaceutical Council of England submitted their interests or disputes to any other body than themselves, and however much he might respect the medical body he should be very sorry to find themselves placed under the wing of the Medical Council. He hoped they would ever remain as they now were, an independent body; and he looked upon the Society as the only recognized body to whom they could refer. Fifthly, they objected to what they termed the unnecessary interference of a medical practitioner that was required by schedule C, but if they had any other plan to propose, why not do so? and then the Society would give it the full consideration it deserved. The sixth and seventh objections were the great injustice that would be perpetrated on all assistants under the age of twenty-one, and that from any participation

in the Benevolent Fund, which claimed to be for the advantage of all, they were to be precluded. Now the latter appeared to him to be a most extraordinary objection. They had a fund of upwards of £6000 subscribed by individuals for a given purpose, but unfortunately it had not been so extensively useful as the Council desired. Means, he was happy to say, had however been taken to make it more so, and although the amount distributed the last year had been greater than in former years, the fund had increased. He took it that if the Bill passed, there would be nothing to prevent all who subscribed to the fund from having a voice in its management. Surely those who did not subscribe to it could not expect to have any voice in its distribution.

Mr. ORRIDGE asked if that line of argument was used with reference to those who had mooted the proposed alteration.

Mr. SAVAGE said he supposed the 'Chemist and Druggist' might be considered to represent the views of the United Society.

Mr. ORRIDGE said he hoped it was not attributed to those who were acting with him.

Mr. SAVAGE said, No, he was merely using it to show that the 'Chemist and Druggist' had taken an active part in the matter, and might be said to represent the views of those outside.

Mr. HOLLIER denied entertaining any such views, or that they were entertained by many of those in his district who were not members of the Society.

Mr. SAVAGE said he was glad he had elicited that expression of opinion, because it relieved him from further occupying the attention of the meeting.

Mr. PEDLER said he was sorry to differ from the admirable speech they had heard from Mr. Edwards, who was an honour to the Council, and who had so ably advocated the course the Council had decided on taking. He thanked the Council for the time and attention they bestowed in promoting the interests of the Institution, and he hoped they would pardon him for occupying their time whilst he stated his reason for differing from them. He differed from them principally on the ground that the legislation sought for was not likely to attain the object and end which they all so much desired, any more than the legislation that had taken place with regard to the medical profession. The Pharmaceutical Society was increasing daily in respectability and influence, and in its hold on public feeling. They found also that chemists and druggists were increasing in every direction, for in small towns where a few years since there were only one or two, there were now half-a-dozen at least, so that they had now become a very large body. An Act of Parliament was obtained for the purpose, if possible, of bringing all into one homogeneous body, but twenty-three years' experience had proved to them the contrary. They had however nothing to regret, but much to be thankful for, because it had had the effect of raising the standard of the members. It had also taught the public who were to be trusted, and daily experience proved that they preferred men who enjoyed the distinctive title of Pharmaceutical Chemists to those who could only call themselves chemists and druggists. Though they had not done all they wished, they had as a voluntary society accomplished much; and consequently many, no doubt, asked themselves the question, why the Pharmaceutical Chemists wanted a Bill for the purpose of regulating the business of chemists and druggists, or rather why it was they were so anxious to go to Parliament at an enormous expense, and in spite of the opposition they were likely to receive, for powers to extinguish the present race of chemists and druggists, for that was really its object. That, he contended, would be the ultimate result if the proposed legislation was granted. He repeated, its effect would be to close every chemist and druggist's shop throughout the kingdom, and were they, he asked, prepared to meet such an opposition as would be raised to it in Parliament? He thought not, and further, he did not believe they were possessed of sufficient power to persuade Parliament to agree to any such measure. He felt convinced that further legislation with regard to chemists and druggists would have the same effect as legislation had had upon apothecaries. When once they tied down chemists and druggists to a particular line they would have some other body vending physic, and things then would be worse than before. He felt certain that Parliament would never grant what they now sought for.

Mr. WAUGH said he sympathized with the doubts and fears that had been expressed by many gentlemen as to their getting these powers. He hoped however they might get it, and that it would be obligatory on the public to always employ thoroughly qualified chemists, but he had great fears that Parliament would pass an Act forbidding every person from taking his prescription to any man he chooses to trust. It was well how-

ever that they had agitated the question, but he thought they must be content to rest on their honours for a short time longer. He was convinced that in the long-run they must make way, and so highly was the distinction of a Pharmaceutical Chemist valued, that he had had assistants who had got up of a morning and made their own coffee, in order to attend the lectures at that Institution. It was all very well to talk about persecution, but he, for one, approved of persecuting lazy assistants.

Mr. HUMPAGE denied that the present movement was of an oppressive character, and the argument that they wished to put the chemists and druggists into a different position was absurd, because they were at present in a different position to the Pharmaceutical Chemist. The broad and distinctive difference between the two classes was that the Pharmaceutical Chemist was an intelligent and educated chemist; and notwithstanding the few that were sent out annually from the Society, its influence was being largely felt; it was, in fact, a leaven that was affecting the whole body. It had been said that only three hundred of those who were registered had passed an examination, but he was informed that between eight hundred and nine hundred had passed an examination, and these no doubt were leavening the whole body. No doubt it was a great mistake in their Act not to compel all who had passed an examination to continue members of the Society. But many had not done so. They had safely passed over the bridge into the land of Goshen, and now they objected to pay a sixpence to keep it in repair for others to pass over. There were two classes of Pharmaceutical Chemists, those who were the founders of the Society, and those who had passed an examination. He unquestionably was no better qualified than many of the present outsiders, but he had cheerfully paid his money towards the perpetuation of the Society, whilst others had pooh-poohed it, and therefore he did not see why these men, now that they found it was a valuable thing, should come in and enjoy the privileges to the fullest extent which the founders and members possessed. These men, after a lapse of twenty-two years, and when they saw there was something more than a name in "Pharmaceutical Chemist," that there were advantages to be gained by it, said it was a very dog-in-the-manger principle not to let them come in on the very easy terms they wished, but he did not think so. He quite agreed with what Mr. Edwards had said, and referring to Mr. Waugh's remark, he could add that he also had had young men who had got up cheerfully, gone without their breakfasts to be able to attend the Institution, and the result was that they were rising every year in their profession and were taking a position such as they never could have done but for the assistance of the Society. Now there were two classes of outsiders, one who was better than the other in point of education. Now it was to be regretted that these men were not members of the Society, and many of them did regret it, and what he said to them was, "Come to the Society, let bygones be bygones, register yourselves, and if you don't feel disposed to attend the lectures and pass an examination, send your children here and induce all your assistants and apprentices to do the same." The advantage of what they now proposed was exemplified in the working of the Legislature with regard to the medical profession. According to the last census returns the medical profession had not increased in numbers, but the chemists and druggists had increased to the extent of 17 per cent., which was solely attributable to their having raised the standard. Whereas, any man who disliked greengrocery, tailoring, or shoemaking, and thought the coloured bottles looked very pretty at night, and so long as he could spell "two tablespoonfuls," considered he was fit to be a chemist and druggist. It was to the want of a standard of education that they had attributed the great increase in their numbers; and there was scarcely a town they went into but they found about double as many chemists and druggists as could get a living by their legitimate trade, and they were driven, as sensible men who had families to maintain, to sell broomsticks, fishing-rods, and the like. He did not blame them for selling those articles, or speak of it disparagingly, but only as illustrating a system that required alteration and improvement. Now the present chemists and druggists ought to co-operate with this Society, and take no apprentices who had not first undergone a preliminary examination; the consequence of which would be to send all the greengrocers, tailors, and shoemakers to the right-about, and bring in only educated men. Those were the men they wanted to join the Society, and it was because they did not that their rooms were so empty. In order to get rid of future ignoramuses they must go to Parliament for extended powers; but he was afraid they would spend money without being successful unless some of the respectable outsiders came to their assistance. Without that he feared the opposition would be too great, and they should have next

year to read in the accounts of the Society a sum of £464. 2*s.* 4¾*d.* for law expenses, and all for nothing. Admitting every little chemist and druggist to the full benefits of the Society was like conferring the title of M.A. on every person who knew the first three rules of arithmetic, in which case the legitimate ones would cry out and ask why they had been so treated. He thought they were acting most wisely in introducing such a Bill, which would work beneficially for all parties.

Mr. Orridge said that before the discussion proceeded further, he wished to say a few words with reference to Mr. Collins's motion. Some gentlemen appeared to think that they were conspiring with the body of chemists and druggists, but that was not the fact, and in proof of that he had received sixteen letters from local secretaries, and also one from Mr. Proctor, of Newcastle, in which they stated that the Pharmaceutical Chemists in their neighbourhoods were favourable to all chemists and druggists becoming members on the payment of an entrance fee. It was upon those letters that he founded his letter which appeared in the Journal.

Mr. W. B. Randall, of Southampton, said the question appeared to be not whether something should be done in the shape of legislation, but what should be done; and the great difficulty they were met with was the strong opposition that existed from a large portion of the chemists and druggists. He was not prepared to say there was not some reasonable opposition to the proposed measure, and therefore he suggested whether it was not advisable to open the door to such an extent as would in a great measure disarm it. He thought there was some weight in several of the objections that had been put forward to the Bill in the 'Chemist and Druggist.' He was a Pharmaceutical Chemist, but not by examination, and there were gentlemen in his town who were apparently quite as well qualified to act in every way as himself; and he could not help thinking that his putting up Pharmaceutical Chemist to make the public believe he was a better man than his neighbours was a sham. Now he wished for something to be done that was fair between all parties; and the question was whether they could not meet the views of all without asking for such compulsory powers as were contained in the Bill. He thought Mr. Edwards, in moving the adoption of the Bill, was not strictly correct when he said the Society did not propose in any way to govern the chemists and druggists, but only to register them, because they proposed that after the passing of the measure none but those should dispense medicines, which would establish it as the governing body of the pharmaceutists of the country. If the Government wished to do anything in the matter, they would naturally come to the Society for information, when they would no doubt be able to get what they wanted. He suggested the possibility of their dividing the outsiders into two classes similar to that which existed in the Society between the examined and non-examined men; one, those who were in business before the passing of the Pharmacy Act, and the other, those who had risen up since then, but had not come in, who were on a par with the examined men; and then, if they would not come in, it would be well to apply for compulsory powers. The suggestion he had made would still make a distinction between them and the examined men, and they would not be doing so great an injustice to the examined men. He strongly urged the possibility of their being able to adopt a middle course that would be satisfactory to all.

Mr. Brady said, in reference to Mr. Proctor's letter, that as a local secretary it ought to have come from himself. So far as he had gathered Mr. Proctor's opinions they were precisely his own, and he might add that in Newcastle and many other northern towns the members of the trade were of opinion that the proposed measure would not improve their position. When the Bill was before Parliament, that tribunal would consider its provisions with regard to expediency and policy, and not as Pharmaceutical Chemists. It would be a great pity to give their opponents an opportunity of mutilating it in Parliament; and therefore he thought they should be careful and not ask for anything they had no reasonable chance of getting. As an examined member, he was inclined to think they would yield their present rights for anything that would prove beneficial to the general interests of the Society. He should be very sorry to let his private feelings stand in the way of anything that would conduce to the benefit of the Society. He was of opinion that a measure for regulating pharmacy must be more expansive than anything they had yet had. They were a comparatively small body, and he did not think those outside the Society had sufficient credit given to them, especially by the London Chemists, for the abilities they possessed. The Pharmaceutical Society was not held in so much estimation in the remote provinces as it was in the metropolis,

and consequently its diploma was less valued. Of the leading men who practise pharmacy not more than three-fifths were Members of the Society, and many of those who were not Members were equal in social standing and influence to those who were. He thought the Bill should be very much modified before they went to Parliament.

Dr. Edwards reminded the meeting that in consequence of a requisition forwarded to the Council, a special meeting was held on the subject, which resulted in a determination that something should be done, and although some thought the present was not the time to do it, others held the opinion that it should be done at once. The opposition to the proposed measure of the Medical Council showed the prevailing opinion with regard to the Society, and that although they had done a great deal as a voluntary society, yet that still something more was required from them for the protection and benefit of the public. No society could be in a much better position than they were, because they were in a condition of growth and progress; and so long as that continued, he maintained they were accomplishing the purposes which they had set before them. He could not quite agree in the proposition that they should include all within their walls, for he was of opinion that the true elevation of pharmacy consisted in their getting together, in a compact phalanx, men who had no self-interests to serve, but who were anxious to do all they could for the benefit of the body. He thought that there was good reason for what was now proposed, and if time permitted he could adduce numerous arguments in its favour. The expressed opinion of men of the highest standing in the medical profession, previous to the passing of the resolution that had been read by the President, showed that action must be taken by some one. The Medical Council in discussing the matter found themselves in a difficulty, and what appeared to trammel them very much, was the trouble it would give them to regulate the pharmacy of the country. They recognize the right of the Pharmaceutical Chemists to take it up, and to be represented on the Council, but not belonging to the profession, they would have no vote, and they would be hampered by those who did not really belong to them. The Medical Council conceded, as a matter of justice, that if they undertook the management of this affair, Pharmaceutical Chemists should be represented on their Board, but they appeared to have given it up, and had forwarded a communication to the Secretary of State. If therefore the Medical Council in that communication had said that something ought to be done—that legislation was urgently called for to ensure competency for the compounding and dispensing medicines prescribed by surgeons and physicians,—he thought they might be said to have the ear of the Government. In the discussion that took place in the Medical Council, Dr. Christison and others referred to this Society as the proper body to bring forward such a Bill, and the history of the Pharmacy Act was brought forward by them as an illustration of the extreme difficulty there was in steering such a Bill successfully through Parliament, and they considered the Society's success in that instance entitled them to some consideration in reference to any other legislation. So far as the Society had gone under that Act, they appeared to have obtained the goodwill of the Medical Council, and that he considered was a reason why they should see what they could do in this matter. They had been unable, as a voluntary society, to get all the trade into one compact body, and the only way in which it could be done was by including registered chemists and druggists in another body, and, like the Medical Association, have two or three bodies enrolled under one general body. It would be impossible for them to take in all the chemists and druggists now in business, and as a consequence of membership for them to be considered Pharmaceutical Chemists, and he deprecated any agitation that would divide their at present unanimous body. It was true they were not a perfectly uniform body. They had the registered founders, and those who had passed an examination, and now, by the proposed Bill they wished to place men, from their education, on the platform whom they called Pharmaceutical Chemists, and also to place at once all respectable chemists and druggists now in business, without any invidious distinction as to qualification, on a platform of registered chemists and druggists. They said that after a certain date those who passed a Minor examination should be allowed to come in and enjoy the privileges of Pharmaceutical Chemists. Those who were on the platform outside the Society, they were willing to take in as Associates, receiving from them in return a small payment if they wished to continue members of the Society, but they by no means insisted on it. Some persons considered the examination test too high, because the same amount of chemical knowledge was not

required in the country as in London. There might be some truth in it, but it should be remembered that it was maintained upon the voluntary principle, each year it had increased, and the students had found it more and more easy to pass the examinations. There would now be the alternative of the Minor examination for those who preferred being only Associates, which would give the security required by the Medical Council that the dispensers of medicines keeping open shops should be competent persons. A participation in the management of the Society he considered should be confined to those who voluntarily contributed to the funds. Apart from themselves, others were moving in this matter, and it became the Society to consider what could be done which would best promote the accomplishment of the object they had in view, and they said it would be by an amendment of their Act, which would give them a registration class from which to draw their future members. Much had been said with regard to the distinction enjoyed by examined members. Now he was inclined to think that the value of the education was of greater consideration than the title, and that there were many young men whose gratitude was so great for the information they had obtained there, that they would give up the distinctive name if they saw it was for the general benefit of the Society; but they must take care and not permit such an influx of non-examined members as would destroy the prestige they had created, weaken the *morale* of the Society, and bring them into contempt. He congratulated the Society upon the number of young men who were now taking an interest in the Society, from the value attached to the education, and impressed on the members that they should, by all the means in their power, abstain from doing anything that would abuse the confidence that had hitherto been placed in the Society. At present they had 2100 members, of whom 420 had passed the Major examination, which was about one-fifth of the body; besides that, there were 428 Associates who had passed the Minor examination upon the faith of the same contract, and who spent their money under the belief that they were making an investment that would prove advantageous to them when they commenced business. The entire number of examined men who had altogether passed the Society amounted to 1005, so that whilst they might have a few men who would be disposed to pay an entrance fee and come into the Society, they had a thousand whose interests they ought to protect, and keep the strictest faith with. He was not at all sanguine as to the number outside the Society who would join them. He did not believe they would amount to anything like a considerable number, because he did not think the same excitement existed now as in 1852, when the Pharmacy Act passed. Even then, after all the energetic means that were taken by Mr. Bell and others, the result was only some 800 gained to the Society, and now he thought they would not gain more than a quarter of that number, even if they admitted all who chose to join them. There was not only an indifference prevailing now, but also a want of sympathy, which was the cause that many did not join them. All that the men who would be on the registered list would have to swallow to take the full benefit attaching to Pharmaceutical Chemists would be a little pride and the payment of a small sum to pass the Major examination, —obstacles which might be very easily overcome if they took a fair view of the case. He believed it would be better for them to remain a voluntary society at the core, than that men should be brought in who were unwilling to swallow a small quantity of pride and pay a small sum in fees.

Mr. REYNOLDS, as a member of the Council and of the Local Society at Leeds, considered it was his duty to inform the Meeting that resolutions had been agreed to by the Pharmaceutical Chemists of Leeds, which he begged to read to the meeting. They were as follows:—

1. That the proposals of the Pharmacy Bill to restrict the use of the terms "Chemist" and "Druggist," and to prevent the keeping open shop for the dispensing prescriptions, by other than registered persons, are attended by so many difficulties that they are not feasible. This meeting would consider it preferable to take as the basis of legislation an enactment confining the sale of certain powerful poisons to persons registered as being qualified for such a trust. It also considers that an annual subscription should be substituted for the single registration fee proposed by the Bill.

2. That the class of "Chemists and Druggists" proposed to be registered under the Bill is entitled, upon every principle of justice, to self-representation in the body by which it would be governed, and also to exemption from serving on juries. This meeting regrets that the Bill does not admit these rights.

3. That for the reasons above set forth, and because believing that the Bill will not be generally acceptable, either to the Members of the Pharmaceutical Society, or to Chemists and Druggists, this meeting would urge upon the Council its reconsideration.

4. The Local Secretary is desired to forward copies of these resolutions to the Council and to the Editors of the Journal.

There was a great difference in the position of the Pharmaceutical Chemists. In London they were nearly all the leading men, but in the towns they were sometimes in a minority, and had to meet outside men who were quite as good as those within. Those men were also working for the good of pharmacy generally, and the prevalent feeling was that this Bill treated these men with injustice, and in a manner which he and those he acted with could not bring themselves to do. He hoped the Society would not incur the great expense of going to Parliament without a better prospect of being successful, for he believed they would be met with a strong opposition.

Mr. Dickenson said the movement in favour of legislation had originated with the outside chemists and druggists, and not with the Pharmaceutical Chemists. He felt certain the Council would not have taken action unless the movement had originated from without. The principle of having only educated chemists and druggists would be a great boon, because it would be one means of stopping the supply of chemists and druggists' shops, and the body must be blind to their own interests not to support the Society in everything they did. His individual opinion was, that the probabilities were against the passing of the Bill in its integrity. They, no doubt, would obtain an Act in some form or other, because all the different bodies were agreed that something should be done, and if they did not do it somebody else would do it for them. The Pharmaceutical Chemists he considered the best body to do it, and those who headed the chemists and druggists in their opposition were acting in the right way to absolve themselves from going to Parliament, and throw it on the Pharmaceutical Society. A great deal had been said about Mr. Edwards having moved on a former occasion a similar motion to that now proposed by Mr. Collins, but the latter should recollect the surrounding circumstances were very different then from the present state of things. The late Sir Robert Peel changed his opinion before he carried the repeal of the Corn Laws, but nobody blamed him for having done so, and he did not see that Mr. Edwards should be blamed because circumstances had occurred which had caused him to change his opinion. He thought they were doing quite right in trying to pass this Bill. It was well known that he was not in the habit of praising the late Jacob Bell, but he thought he deserved praise for the trouble and expense he went to in getting into Parliament for the purpose of carrying his Bill. Mr. Bell was told he would never succeed, but he succeeded in carrying a measure which, though not in the form in which he introduced it, had proved a boon to the Pharmaceutical Chemists of this country. He advised the Council to persevere, and it would be to the interest of the chemists and druggists to join them. He thought Mr. Collins's argument of the Golden Pill went against their opening the door as proposed, for if they had such a registration as he wanted, they would immediately have plenty of persons selling golden pills. He advised the chemists and druggists to join this Society heart and hand, and gain, if possible, this great boon.

Mr. Hartley, as an examined member, had no wish to quarrel with the Council, on the contrary, he was perfectly satisfied with what they had done, and he admitted that they had on all occasions acted wisely and discreetly for the interests of the Society. He felt satisfied that the examined members as a body had no desire to place themselves higher at the expense of others, but rather to advance that which was for the general interests of the trade.

Mr. Edwards rose to reply. He said: I shall not repeat again the arguments which have been used, but leave them to rest upon you with the weight you may please to give them, but respect for the opinions uttered at this meeting demands that I should say a few words in reply, and before I do this, let me direct your attention to the independence you perceive in the Council; you have seen how freely and fully every man has not hesitated to maintain his opinion, even when conscious that he was opposed to the majority of his brethren. You may be sure then that your representatives do not hesitate at all times fully to maintain that which they consider to be for your benefit, however unpopular it may be. Let me tell first, then, my friend Mr. Collins that I have not turned my coat, or altered my opinion, but that twelve years have made a great difference in the state of the case. I did wish all those referred to had joined us then, I wish it now

with all my heart, but then it was to begin the new state of affairs; we had only just had the title offered, the engagements were not entered into, but now all this is very different indeed. And let me say, in answer to threatened efforts made to sway Members of Parliament, that there are two sides to that question. Members must look to constituents on our side as well as the other, and if their supporters come to them and say, I wish you to oppose this Bill, they will naturally reply, "What are the reasons for doing so?" Now I should be ready to say, Just take the Bill and study it, and then look at these eight objections—this is absolutely all there can be said against it—and leave them to decide the question for themselves. Surely a feebler affair never saw the light; most of them are mere matters of detail and bye-law, and others, pure misrepresentations. Take for example local examinations: why, we are quite anxious to have them, if they can be managed, but all *that* we can do now with our present Act, without going to Parliament at all. The Benevolent Fund again, of course every man who subscribes to it will have a voice in its management whether he belongs to the Society or not. And then I would reply to Mr. Randall, that the objection he makes would have equal force, if the persons he alludes to were admitted. Still a person would say, I am as well qualified as you; the difference is, that you went into business in 1852, and I happened to do so six months later, and to give you permission to put up a title which shall persuade the public that you are more worthy of their confidence than I am, just on this account, is nothing but a sham. There always must be some line or other, and it will always be easy to find persons just divided by the boundary whose rights can hardly be distinguished from each other. It is the only thing of weight that I have heard urged, and I may just say that I have always been desirous of admitting those who were in business before the passing of the Act, and it was chiefly through me (although it is letting out some of the secrets of the prison-house) that the inquiry was set on foot two years ago, as to how many were likely to avail themselves of the offer, if the door could be opened. We sent round for returns from all the local secretaries, and were very much surprised by the result; we found in some places there was one, in some two or three, but they were generally so content to be as they were, or so utterly apathetic about it, that not anything like fifty in all the kingdom could be found who were likely to come in, if the door could be opened. And then, on the other hand, we had letters from all quarters upbraiding us with breach of faith, and expressing sentiments very different to some of those we have heard to-day: of course the project was at once abandoned. I know it is very different now: there are plenty who would willingly come in, but it is the substantial eloquence of the Jury Bill that they care for, and that has so suddenly convinced them how unjust it is to keep them out of the honours and privileges that they value so highly; and unless you are willing to yield everything, and give up to every one the name of Pharmaceutical Chemist and every advantage belonging to it, you will still have all the opposition which meets you to-day.

Mr. Collins said he would rather they appeared to act as one man, and therefore, to prevent anything like a want of unanimity, he would withdraw his amendment.

The President expressed his approval of its withdrawal, and observed it was very important they should act as one man.

The original motion was then carried unanimously.

Twelve scrutineers having been appointed, the ballot was opened at an earlier period of the meeting.

Thanks were then unanimously accorded to the President, and also to the Council, which being duly acknowledged, the Meeting was adjourned to Friday morning, at eleven o'clock.

ADJOURNED MEETING.

Friday, May 20th, 1864.

MR. SANDFORD, PRESIDENT, IN THE CHAIR.

The Scrutineers brought up their Report, as follows:—

We, the undersigned Scrutineers, appointed at the Twenty-third Annual General Meeting of the Pharmaceutical Society of Great Britain, do hereby certify that we have examined the voting-papers committed to us, and report the following results:—

Voting-papers received.........	694
Disallowed for informality ...	7
	687

Baldock	270	Deane	615	Hollier.........	376	Savage	585
Bird	539	Evans	547	Mackay	611	Squire	605
Bottle	455	Gissing	310	Morson	631	Standring ...	558
Colbeck	320	Hanbury	628	Orridge	430	Waugh	550
Davenport ...	532	Herring	525				

William Watts, *Chairman.*
Thomas Kent.
Joseph Kettle.
Samuel Gale.
Charles E. Turner.
Jno. Willows.
William Orridge.
Frederick Andrews.
Michael Carteighe.
Isaiah Bourdas, jun.
Charles Coles.
Jno. T. Tupholme.

The following Members were therefore declared to constitute the Council for the ensuing year:—

Council.

Bird, William Lionel, 42, Castle Street, Oxford Street.
Bottle, Alexander, 37, Townwall Street, Dover.
Davenport, John T., 33, Great Russell Street.
Deane, Henry, Clapham.
Edwards, George, Dartford.
Edwards, John Baker, Royal Institution, Liverpool.
Evans, Henry Sugden, 52, Hanover Street, Liverpool.
Hanbury, Daniel Bell, Plough Court, Lombard Street.
Haselden, Adolphus Frederick, 18, Conduit Street.
Herring, Thomas, 40, Aldersgate Street.
Hills, Thomas Hyde, 338, Oxford Street.
Mackay, John, 119, George Street, Edinburgh.
Morson, Thomas N. R., 38, Queen Square, Bloomsbury.
Orridge, Benjamin, 30, Bucklersbury.
Proctor, Barnard S., 11, Grey Street, Newcastle.
Reynolds, Richard, 13, Briggate, Leeds.
Sandford, George Webb, 47, Piccadilly.
Savage, William Dawson, 65, Edward Street, Brighton.
Squire, Peter, 277, Oxford Street.
Standring, Thomas, 1, Piccadilly.
Waugh, George, 177, Regent Street.

There being only the requisite number of Candidates proposed for election as Auditors, the Chairman declared the following, who had been nominated and had signified their willingness to accept the office, duly elected:—

Auditors.

Barron, Frederick, 2, Bush Lane, Cannon Street.
Burgoyne, James, 16, Coleman Street.
Carteighe, Michael, 172, New Bond Street.
Crispe, James, 4, Cheapside.
Garle, John, Bromley, Kent.

The Scrutineers further reported that they had examined the voting-papers for Local Secretaries returned with the voting-papers for the Council, and handed the list to the Chairman.

Voting-papers received	496
Disallowed for being insufficiently or not filled up..................	33
	463

A vote of thanks having been passed to the Scrutineers and to the Chairman, the meeting separated.

PROVINCIAL TRANSACTIONS.

LIVERPOOL CHEMISTS' ASSOCIATION.

The Thirteenth General Meeting was held at the Royal Institution, April 21st, 1864; the President, J. SHAW, Esq., in the chair.

Several donations to the Library and Museum were announced, and Mr. J. GLOVER read the following paper on "Photography as an Incentive to the Study of Chemistry:"—Much has been said and written upon the artistic bearings of photography, in which some of the votaries of high art have endeavoured to shade its lustre by pointing to its followers as men of baths, chemicals, and mechanical science. I am rejoiced to say, however, the claims of photography as a handmaid to art are being ably discussed, and are becoming partially recognized. I trust the day is not far distant when she will hold the high position as an art-science which she honourably deserves.

It is not, however, my intention this evening to enter upon any of these questions, but rather to discuss photography as an interesting branch of chemical science; one well calculated to engage the attention of the associates, as it places before them in a tangible form a large meed of reward for labour well spent.

To those who are engaged in the laboratory, pursuing the study of chemistry as a chosen profession, by which they have determined, as youthful aspirants, to make headway in the world, and whose hearts and souls are fully engaged in the object contemplated, I now address myself. Let me fancy for a moment one of these young men just commencing his studies in the direction I have described—for instance, during his first attempt at crystallization. How carefully does he watch the ebullition of the evaporating dish, and when his solution arrives at the specific gravity required, with what impatience does he await the cooling of the liquid, and with what eagerness he observes the formation of the salt. But the great feature of all to him is the gathering of that first crop of crystals, which, in his estimation, are the most beautiful forms he has ever beheld.

Just so is it as we advance in chemical research. It is the *results* which repay all our efforts, and it is in proportion to the importance of those results that we experience delight. Now in photography we have a combination of important and most interesting chemical manipulations, many of them of a complicated and delicate nature; food for the most enthusiastic chemist, and ground over which, although thousands have trodden, there is much hidden treasure; and much honoured will those men be who succeed with the ploughshare of truth in bringing those hidden treasures to light.

It is a great and indisputable fact, that some of the most important points in connection with this art are but vaguely understood. I am grieved, on account of the interests of science, that this should be so; but I am glad for your sakes, and for that of explorers generally, that the case stands as it does. Still, I would not have you suppose that there are no men of eminence employed in these investigations, for, all honour to them, we boast of having engaged the attention and anxious thought of many of the first chemists of our day, both in this and other lands; but still there are many conflicting theories, and much that is surrounded with mystery.

"The race is not always to the swift, nor the battle to the strong." It is not always the most advanced in any branch of information that secure the golden fruit. Those who have been considered comparatively illiterate in scientific knowledge, have sometimes been able to confound the wise; so that, unlike the phantom search for the "philosopher's stone," there is at least *hope* for every one that success shall crown *his* efforts, who gives his attention to the advancement of any particular branch of inquiry.

Following out our primary idea, which I am most anxious to enforce upon your attention, that in proportion to the magnitude of our results is our satisfaction increased, allow me to expatiate on the peculiar advantages offered by photography in this respect. There is not only the honour of probable success in our exploration after truth, but in every photographic experiment we have something in the photograph itself which repays us tenfold for our toil. What is more beautiful to contemplate than one of Nature's truthful sun-pictures, when the various operations by which it has been produced have been carried out in a satisfactory manner, coupled with the knowledge that

it is the work of our hands and the conception of our intelligence? and this result can be consummated by any painstaking chemist possessing a small share of the inspiration of an artist. Leaving out the art-question altogether, we still have something which brings with it, but in a much higher degree, the pleasurable sensation of the young chemist to whom I have already alluded.

Photography, although a child of the present generation, has effected much for science in optical knowledge, but more especially in chemistry. It has brought to light many reactions which before were never dreamt of. It has led to the investigation of a class of salts and compounds which before its introduction were very obscure, because they were considered unimportant. It has interested a class of men in the study of chemistry who beforetime looked upon it as a very dry subject, picturing its votaries as men, described by the poets and novelists, in slippers and dressing-gowns, burning the midnight oil, and poring over the molten contents of the crucible. Happily, however, this enthralling study has dispelled many of these visions of fancy, and there are now to be numbered among photographers men who once thought lightly on scientific matters, but now are to be found among their most enthusiastic admirers. This change may be solely attributed to the influence of the photographic art, which first brought these subjects under their notice in so enchanting a disguise.

It may not perhaps be out of place here to glance at one or two of the leading questions in this branch of chemical research, which are now engaging the attention of the learned. It will appear somewhat strange to the uninitiated that the very foundation of all photography is not yet acknowledged to be clearly understood. The formation of the "photographic image" (the subject to which I allude) has received a considerable share of attention by chemists; but the changes which take place are of such a subtle nature,—nay, the very action of light itself on the sensitive tablet has been hitherto wrapt in such obscurity, and besides these, there is the undoubted combined influence of electricity, the whole being so intimately woven that the chemist alone becomes powerless to grapple with the question, and has to call in the aid of the philosopher to assist him in the unravelment of the skein of mystery. In the course of the year that has passed, I attempted a few efforts in this direction, and I trust not altogether in vain. At some future time I shall have pleasure in laying before this Association the result of my experiments, if it is thought that the members will take any interest in a subject at present so foreign in its nature to the general routine of its business.

Out of the many other questions which are now receiving the investigation of scientific photographers I will mention but one more, and that because it is of the utmost importance, affecting the great matter of the imperishability of the final results. The process of printing upon paper by means of the action of light on chloride of silver has for some years been a stumbling-block and root of bitterness to the followers of the art. The question becomes more and more complicated by the fact, which is constantly brought before us, that while some of those pictures which were produced during the infancy of the process have withstood the ravages of time and retain their pristine beauty, although frequently very little care has been bestowed upon their preservation, there are others which, as far as human intelligence can judge, have been treated identically the same, which are but of yesterday comparatively speaking, but are fading from our view, leaving scarce "a wreck behind."

Efforts are now being put forth to produce the positive images by other means than that of silver printing, and, I am happy to add, with marked success. Not the least important is the attempt to substitute carbon for the silver, which has only very recently been satisfactorily accomplished by Mr. Swan, of Newcastle-on-Tyne. The details of his process have just been published in a paper read this month at a meeting of the London Photographic Society, and I have the pleasure to lay before you one of the specimens. The results are acknowledged by all to be equal, if not superior to silver prints, and there can be no doubt with regard to their permanency.

Perhaps the greatest novelty, and the one which will outvie all others for popular illustration by means of photography, is the transfer of the photograph itself to the copper-plate and the lithographic stone. There now exists not the least doubt but that this feat will be satisfactorily accomplished.

In appearing before you this evening as a body devoted expressly to the world of chemistry, I have a specific object in view. If any branch of art or science is worth following at all, it is desirable that it should be pursued in a systematic manner. I

confess before you with humility that there are many photographers, especially among those who engage in the art as a profession, who are very much influenced in their operations by the rule of chance. Most of the additions to the general stock of information have been achieved by the amateurs, men who have studied science for the love of it, and not for profit; and yet these are the very men who can afford to devote the least time to such matters.

In addressing you then as those engaged in commercial pursuits, but who still feel and acknowledge, by the establishment and maintenance of such an Association as this, that you are deeply alive to the importance of the hidden mysteries of chemistry, I wish to engage your sympathies so as to infuse a little of your enthusiasm into that comparatively neglected branch of your wondrous science which I humbly represent, and thus by your example and co-operation assist us in the meritorious work of bestowing upon photography an acknowledged place among the sister branches of art and science.

The thanks of the meeting were cordially awarded to Mr. Glover for his interesting paper.

The Fourteenth General Meeting, May 5, at the Royal Institution; Mr. J. Shaw, President, in the chair.

Several donations were announced to the Library and Museum, and thanks accorded.

Dr. Edwards introduced and explained the automatic percolator, and a discussion followed.

The Lecture of the evening was by Mr. Edward Davies, F.C.S., on Iron.

Mr. E. Davies, F.C.S., then delivered a lecture on "Iron." The subject, he said, was one for which, from the importance of iron and its compounds, both generally, and also with reference to pharmaceutical preparations, he asked their attention whilst he brought before them some of the important facts relating to this most valuable metal. Iron is one of the earliest mentioned metals. This is not improbably due to the numerous masses of meteoric iron scattered over the earth's surface. Iron weapons and tools have in modern times been made in Africa from this source. It is remarkable that the most useful metal should be one which has fallen from the skies as a gift of Heaven to man. This may explain the great value which was attributed to this metal in Homeric times, when at the funeral games in honour of Patroclus, the discus of iron to be thrown was itself thought worthy to be the prize. Iron is everywhere, in the dust of the air, in the water, and in the earth. Scarcely can anything in nature be named, in which chemical tests will not reveal the omnipresent element. Of no metal is there such store in the bowels of the earth, and there for the use of man does it lie, until with mighty labour it is extracted from its ores.

The process of smelting, puddling, and manufacturing steel, both by the old method of carbonizing and the newer one of partial decarbonizing of the cast iron, were then described.

No metal is capable of such immense increase of value by manufacture. From a raw material of a value too small to note, hair-springs for watches may be made worth £130 the ounce troy, almost thirty times the value of fine gold.

The compounds of iron naturally begin with its oxides, as these are the forms in which it is usually met with. The protoxide, which cannot be isolated, when hydrated, is used in medicine; like the other oxides and compounds insoluble in water, its activity depends on its being dissolved by the acids of the stomach, and taken into the system.

The magnetic oxide, remarkable for the property from which it derives its name, and important as the source of the best Swedish iron, follows, being a compound of the protoxide with the sesquioxide, and is also used as a medicinal agent.

The sesquioxide is that oxide with which we are most familiar, as in the form of rust it is unfortunately often to be seen. Hæmatite, an ore much used, is also this oxide. Sesquioxide of iron has usually little or no magnetic power, but if the artifically-prepared magnetic oxide be gently heated with chlorate or nitrate of potash, it retains its power of being attracted by a magnet, though entirely converted into sesquioxide. This discovery, made in 1860, by Mr. Robbins, a member of the Pharmaceutical Society, may stir up young pharmaceutists to venture in pursuit of new truths, as original research need not be confined to professional chemists. Insoluble as sesquioxide would appear to be in water, Professor Graham's researches in dialysis have shown that by gradual removal of the hydrochloric acid, perchloride of iron may be decomposed, and a solution of peroxide of iron in water obtained. This solution is readily destroyed, a drop of acid, or alkali, or even of a neutral salt, being sufficient to precipitate the whole of the oxide.

Of the salts of iron the protosulphate is the most extensively prepared, being the product of the oxidation of iron pyrites, and a bye-product in the alum manufacture. Its poisonous properties are marked. Dr. F. Crace Calvert, a few years since, analysed the contents of the stomach of a man poisoned by it. It is used in medicine, but is a harsh method of administering this valuable medicinal agent.

The perchloride is best prepared by forming the protochloride in crystals, dissolving in water, and passing a slow current of chlorine until no blue is produced with ferricyanide of potassium. The excess of chlorine is expelled by a gentle heat, and the solution will bear evaporating down to the crystallizing-point without decomposition. The process given in the Pharmacopœia is not good, as a sample prepared in strict conformity to its directions gave a dark liquid containing protosalt and nitric acid. On heating more strongly, the solution became muddy from formation of a sub-salt.

The tartrate of iron has the property of not being thrown down by alkalies; the citrate also acts in a similar method. This doubtless exerts an influence on their therapeutic action, and may account for the favour in which these remedies are held. A compound described in the 'Chemical News,' an albuminate of iron and soda, from its resemblance to the compound of iron which exists in the blood, will probably prove a valuable remedy.

The peracetate of iron has the property of losing its acid when exposed in solution to a heat of about 200° F. for a length of time. This solution is opaque to reflected light, but transparent to transmitted, does not give the usual tests for iron, has no inky taste, and has, in fact, lost the distinctive peculiarities of an iron salt.

These are some of the facts connected with iron; only a small selection could be made from the immense store, to which almost daily additions are made. Materially speaking, this is an iron age, for iron is superseding all other materials. Is it wood? our ships were British oak, but the naval poet of the next generation must sing of British iron. Stone—our bridges did come from the quarry, but now from the mine and foundry. In thin sheets it has been proposed as an indestructible material for books to substitute paper, and, when enamelled, steel collars invade the domain of linen. This metal may take a life with sharp cut or thrust, or may restore the languishing invalid to strength and energy. To it we owe our country's greatness in large measure; with it we make the bridges, the machinery, the ships which are the modern wonders of the world; and with it too the sons of brave old England stand ready to defend their treasures and to bid defiance to a world in arms.

The lecture was illustrated by experiments and specimens.

The thanks of the meeting were accorded for the most able and interesting discourse.

LEEDS CHEMISTS' ASSOCIATION.

The Ninth Meeting of the session was held at the School of Art, on the evening of May 18th; the President, Mr. Harvey, in the chair.

Mr. Abbott read a paper upon "Linimentum Saponis." After describing the inconveniences resulting from the gelatinization of soap liniment made according to the formula of the Pharm. Lond., 1851, he pointed out the objections to the two methods which had been sometimes proposed as substitutes, viz. the use of soft soap, or of a weaker spirit. The use of soft soap is obviously contra-indicated by the bleaching action of its liniment upon tincture of iodine, whilst rectified spirit is preferable to proof strength for combining with chloroform, iodine, compound camphor liniment, etc.

Where watery extracts, as belladonna, had to be mixed with the liniment, the weaker spirit had advantages; but the introduction of Linim. Bellad. Brit. Pharm. would obviate the necessity ot such prescriptions.

Mr. Abbott described the valuable experiments upon soap liniment made by Mr. Deane (Pharm. Journ., vol. xviii.), to which Mr. Groves has added. These prove that whilst rectified spirit will dissolve only a part of hard soap in the cold (viz. the oleate of soda), an increase of temperature to 70° F. will take up nearly the whole of the remainder (the margarate of soda).

The formula for Lin. Saponis, Brit. Pharm., being nearly identical with that of the Pharm. Lond., 1851, the criticisms which had been applied to the latter still held good. The author's own experience in endeavouring to follow strictly the British Pharmacopœia was as follows:—

Hard soap is prescribed, and is defined as being "greyish-white, dry, inodorous." It is ordered to be made from soda and olive oil. Some was accordingly prepared, and the liniment was accurately made from it, excepting that a small portion would not dissolve as long as the heat did not exceed 70°. This liniment had only a faint greenish tinge of colour, and remained fluid when exposed to great cold. It was doubtless such a preparation as was intended should be produced. Since a pure olive-oil soap was not a commercially recognized substance, it was needful to examine the soaps which were often used for this purpose, and the following are some experiments:—

1. Mottled Castile soap digested at 68°, as prescribed by British Pharmacopœia, gave 12 per cent., insoluble residue (margarate of soda), and the product did not gelatinize in the cold.
2. The same at 120°: all dissolved, but the proportion of margarate of soda was too large to be retained at a low temperature, and gelatinization followed.
3. White Castile soap at 68° left 27 per cent. residue.
4. The same at 120° dissolved, but gelatinized.
5. The olive-oil soap at 68° left 5 per cent. residue, and continued fluid at 32°.
6. The same at 120° dissolved entirely, and also remained fluid at 32°.

This experiment confirmed the statement of Groves (Pharm. Journ. vol. xviii. p. 502), that an olive oil which had lost much of its margarin by deposition in cold weather, would dissolve to a greater extent than is ordinarily the case with hard soap.

Mr. ABBOTT submitted that these experiments were sufficient proof that neither kind of Castile soap ought to be employed, and especially they indicated that if the white variety were used, the liniment would contain less than three-fourths of the quantity of soap which it should. He believed that it contained much stearate of soda, from the use of animal fat.

Mr. YEWDALL read a short paper upon "The Value of the Marc left in the Preparation of Tincture of Opium."

His object was to compare the processes of maceration and percolation respectively as affecting this. Tincture of opium was prepared, in a York Glass Company's percolator, from pulv. opii. turc. mixed with half its bulk of sand. The loss of proof spirit was at the rate of six ounces per gallon, after pressing the marc. The marc was then treated with repeated quantities of distilled water, the washings concentrated and submitted to processes which were described, for the separation of morphia and the other constituents.

For comparison with Mr. Davis's results upon the marc of tincture made by maceration (Pharm. Journ., N. S., vol. v. p. 462), Mr. Yewdall stated the morphia from the marc of three gallons of percolated tincture as being 16·8 grains, against 42 grains found by Mr. Davis in the marc of macerated tincture.

These comparisons do not inform us of all that it is desirable to know, because the samples of opium used were not the same.

The author alluded to the various modified processes that have been suggested for making tincture of opium, and expressed approval of that which adopts a hard watery extract instead of the crude drug, as giving a nearer approach to uniformity of result.

The President announced that this would be the concluding meeting of the present session.

LECTURES ON THE BRITISH PHARMACOPŒIA.

ON THE RELATION OF THE BRITISH PHARMACOPŒIA TO PHARMACOLOGY.

LECTURE II.

Delivered before the Members of the Pharmaceutical Society, April 20, 1864.

BY DR. JOHN ATTFIELD, F.C.S.,

DIRECTOR OF THE SOCIETY'S LABORATORIES.

In considering the preparations of the Pharmacopœia with the view of ascertaining to what extent the authors of the work have succeeded in representing

the advancement which has been made in Pharmacy since the last English, Scotch, and Irish Pharmacopœias were published, I had, in my last lecture, arrived in due alphabetical order at the LIQUORS. I have only two other liquors to notice.

Liquor Morphiæ Acetatis of the London and Dublin Colleges is omitted from the preparations of the British Pharmacopœia. This is well, for E. Wood showed (Pharm. Journ. vol. xvi. p. 531) that it became brown and ineffective on standing. Its place is supplied by the *Liquor Morphiæ Hydrochloratis* of the three old Pharmacopœias, the strength of which will now be equal, instead of as strong again in Scotland as in Ireland or England,—another illustration of the many advantages secured by the publication of a national Pharmacopœia. The formula includes a small quantity of hydrochloric acid, which will be found to probably assist in dissolving and preserving the hydrochlorate of morphia.

Liquor Potassæ. I have nothing to say concerning the process for the preparation of solution of potash; it is a very good one, and is perhaps the only one that can be used with advantage on a large scale. It also gives a liquor sufficiently pure as a medicinal remedy. Indeed, it is an improvement on the old process, inasmuch as slaked lime is now ordered in place of quick lime. But, seeing that the authors of the Pharmacopœia have obviously been desirous to instruct the apothecary, pharmaceutic chemist, and student, rather than the manufacturer, and have ordered quantities and processes to suit them and not him, it would have been more consistent had they included for the preparation of Liquor Potassæ a well-known process, which, in place of iron vessels, stirrers, a source of heat and the employment of much time, requires only the aid of a common bottle.

Redwood has shown (Pharm. Journ. 2nd ser., vol. ii. p. 455) that if the carbonate of potash and excess of hydrate of lime be simply well shaken with water in a bottle, until a little of the solution does not effervesce on the addition of an acid, a liquor potassæ is produced, which is even purer than the officinal article. The students in the pharmaceutical laboratories, and I myself, always employ this process in preparing our test solution; and if we may act on Garrod's statement (Med. Times and Gaz., 1864, vol. i. p. 359), that the object of the Pharmacopœia Committee has been to give processes by which each chemical drug *can* be made, not the one to be necessarily adopted in its manufacture, then I do not see why apothecaries and pharmaceutic chemists should not adopt the process too. The authors of the British Pharmacopœia, in not introducing it into their work, missed a good opportunity of gracefully showing their appreciation of the labours of Pharmacologists.

LITHIÆ CARBONAS.—The Pharmacopœia does not contain a process for the preparation of this rare chemical. The student will find one in the 'Pharmaceutical Journal' (vol. iv. p. 132), or in any of the modern books of chemistry.

MEL.—The only test given for the detection of adulteration in honey is that of iodine for starch. No means is indicated whereby the presence of water, glue, mucilage, and albumen, as found in the Rhône honeys by Frickhinger (Pharm. Journ., vol. xvii. p. 32), can be determined.

MISTURÆ.—*Mistura Creasoti.* This preparation is from the Edinburgh Pharmacopœia. It is the only preparation in which glacial acetic acid is used, and even here the employment of the acid would seem to be unnecessary, for Pereira states (Mat. Med., 3rd edit., vol. ii. p. 2012) that one part of creasote dissolves in eighty of water. In the mixture now ordered, one part of creasote is present in four hundred and forty of water, so that the acetic acid must be unnecessary as an aid to solution of the creasote, and this is apparently its only use. The spirit of juniper in the formula is stated (Lancet, 1864, vol. i. p. 195) to make the mixture milky, so that altogether the preparation needs investigation by Pharmaceutists.

Mistura Cretæ has pretty much the characters of the old formulæ, though the gum which aids in suspending the chalk was stated by Proctor (Pharm. Journ., 2nd ser., vol. i. p. 11) to be present in too small a quantity.

Mistura Ferri Composita. Bell said (Pharm. Journ. vol. xviii. p. 459), "It is an obvious oversight in the London and Dublin Pharmacopœias that the myrrh (in Mistura Ferri Composita) is ordered to be used *in powder.* The elegance and perfection of the preparation depend on the selection of a sound piece of myrrh, not at all dry, and which, when carefully rubbed down, makes a good emulsion." The Edinburgh College ordered "myrrh bruised" in their last Pharmacopœia. The British Pharmacopœia still orders "myrrh in powder."

Mistura Gentianæ Composita. This compound mixture—compound in a fourfold degree, for it contained two compound infusions and one compound tincture; altogether a compound containing no less than twelve galenical simples; stigmatized by the last great pharmacologist quoted as a useless incumbrance on the shelves of the druggist (Bell, Pharm. Journ., vol. xviii. p. 460), and admitted (*ibid.*, 461) by a member of the London Pharmacopœia Committee, whoalso was a member of the British Pharmacopœia Committee, to be inserted in the London Pharmacopœia only to save physicians the trouble of writing three lines instead of one—has at last been excluded from the Pharmacopœia altogether.

MORPHIÆ HYDROCHLORAS.—The quantitative method of determining the purity of this salt, given in the Materia Medica division of the Pharmacopœia, is a new and useful introduction; for if the specimen responds to the conditions required, the absence of water, sugar, as found by Morson (Pharm. Journ., vol. ix. p. 361), salicin suspected to have been detected by Macfarlan (Pharm. Journ., vol. ix. p. 337), and several other possible adulterants, will be ensured.

PILULÆ.—*Pilula Aloes Barbadensis* is most like the *Pilula Aloes cum Sapone* of the London Pharmacopœia; but extract of liquorice is omitted, as suggested by Proctor (Pharm. Journ., 2nd ser., vol. i. p. 11); hard soap replaces soft, as suggested by several pharmaceutists, oil of carraway is introduced, and treacle is replaced by confection of roses..

Pilula Aloes Socotrinæ is not like any aloe pill in either of the three old Pharmacopœias. It is obviously constructed on the model of Pilula Aloes Barbadensis, probably to give medical practitioners a choice of the two varieties of aloes. If it is intended to replace the *Pilula Aloes (Socotrinæ) Composita* of the London Pharmacopœia, Proctor's suggestion to omit the extract of gentian (Pharm. Journ., 2nd ser., vol. i. p. 11) is met. It more nearly, however, resembles the Edinburgh *Pilula Aloes.*

Pilula Calomelanos Composita. This is the Edinburgh and Dublin name of the London *Pilula Hydrargyri Chloridi Composita.* The old excipient, treacle, is now replaced by castor oil; a matter of detail, long (Pharm. Journ., vol. vii. p. 551) advocated by pharmaceutists. The Dublin College did order castor oil to be used. It contains one grain of calomel in five grains of the mass.

Pilula Cambogiæ Composita is according to the Edinburgh formula. It is about double the strength of the old London preparation.

Pilula Colocynthidis Composita. The London compound colocynth pill having gone back to its old (1836) position as an extract, its place is supplied by the Edinburgh preparation; a change recommended by Bell (Pharm. Journ., vol. xviii. p. 457). The Dublin preparation has suffered most by these changes; its hard soap and treacle being omitted, and its proportion of scammony much increased.

Pilula Colocynthidis et Hyoscyami. This also is an Edinburgh pill, of which a complaint has been registered (Med. Circular, vol. xxiv. p. 169) that it is "always getting mouldy."

Pilula Ferri Carbonatis. This is the London *Pilula Ferri Composita*, the manufacture of carbonate of iron which went on inside that pill, having been

superseded by manufacture outside it, and subsequent introduction as saccharated carbonate of iron. This most orthodox improvement was suggested by Davenport (Pharm. Journ., vol. xi. p. 484).

Pilula Ferri Iodidi. This is a new pill. The process is that of Christison (Pharm. Journ., vol. iv. p. 79).

Pilula Hydrargyri. This is the old pill made in the old way. Donovan, cited by Thomson (Pharm. Journ., vol. iv. p. 413), had stated that when made with oxide of mercury instead of metallic mercury, it was quite as efficacious; and Thomson himself had long thought that the efficacy of the old pill depended in great measure on the presence of a portion of oxide of mercury derived from oxidation of the metallic mercury, when in that fine state of division to which it is necessarily brought by long trituration with the confection of rose and liquorice. Tyson, an excellent therapeutist, as well as a good practical chemist, stated (Pharm. Journ., vol. i. p. 451) that the Pharmacopœia blue pill was, under the best management, a very uncertain preparation. He made pilula hydrargyri with the protoxide, and communicated his formula to the 'Pharmaceutical Journal.' It was as follows:—

Pilula Hydrargyri Protoxidi.

℞ Hydrargyri Protoxidi ʒj.

Confectionis Rosæ Gallicæ, ʒiij.

Pulvis Florum Anthemidis ʒss. M. s. a. et fiat Massa.

Tyson says, "Here we have a preparation, with only half the quantity of mercury, far superior to, and of the same colour as the blue pill; always the same in effect, always certain, and made in a few minutes. I use the powdered chamomile instead of the liquorice powder, as it keeps better, and sits more pleasantly upon the stomach." Tyson made his protoxide (black oxide) of mercury from calomel, also by an ingenious modification of the usual method. He says, "But the great secret that remains, is to procure the slate-coloured protoxide aqua calcis will not do, as it produces an ash-colour from a mixture of muriate of lime; liquor potassæ alone will not do, for it produces a brownish-black powder, containing a portion of submuriate of mercury undecomposed, and which no addition of liq. potassæ will act upon, but by the addition then of a small quantity of liq. ammoniæ (as well as liq. potassæ), the calomel is completely decomposed, and the slate-coloured protoxide immediately produced." I have quoted these observations of Tyson, because I believe they contain the basis of a method of preparing a much better and more rational blue pill than the officinal article; I commend them to the notice of therapeutists.

Pilula Opii. This is the Dublin *Pilula Saponis Compositum;* it is also the same pill of the London College, with the omission of liquorice, and with lard instead of soft soap, as suggested by Boucher and Proctor (Pharm. Journ., 2nd ser., vol. i. p. 15). It also replaces the Edinburgh *Pilula Opii sive Thebaicæ*, sulphate of potash and confection of roses being substituted by hard soap and water.

Pilula Rhei Composita. The quantity of soap as compared with the amount in the London formula has been much increased, as suggested by Proctor (Pharm. Journ. 2nd ser., vol. i. p. 11). Oil of peppermint also replaces oil of carraway, as suggested by Southall (*ibid.*, p. 12), who moreover expressed an opinion that the Dublin formula was preferable to that of the London College. The Dublin formula is, in fact, the one retained. It is slightly weaker than the London and Edinburgh varieties.

Pilula Scillæ Composita. This preparation is still made with the squill in fine powder. Niblett (Pharm. Journ. vol. xii. p. 153) proposed to use an acetic extract of the squill, to obviate the trouble occasioned by the powder rapidly becoming unfit for dispensing purposes. Such a pill was, he said, highly approved of by medical practitioners. The formula retained is that of the Dublin

Pharmacopœia; it is much the same as the Edinburgh, but is of double the strength in squill as compared with that of the London.

Podophylli Resina.—The resin of podophyllum is precipitated on pouring a concentrated tincture of the dried root into water acidulated with hydrochloric acid. I have been asked, "What is the use of the hydrochloric acid?" Its use is to precipitate hydrochlorate of berberia (not beberia), and was proposed by Maisch (Pharm. Journ. 2nd ser., vol. v. p. 183), who succeeded in preparing berberine—or berberia as we must now call it in conformity with Pharmacopœial nomenclature—from podophyllum, its occurrence there having been previously pointed out by Mayer. It is probably an, if not the, active principle of podophyllum.

Potassa Sulphurata is the old *Potassii Sulphuretum;* a name which Muskett (Pharm. Journ. 2nd ser., vol. i. p. 214) suggested should be altered, inasmuch as it implied a composition which the preparation does not possess. The vague character of the new name is quite consistent with the character of the preparation.

Potassæ Bicarbonas.—The process and necessary apparatus for the preparation of this salt will be found described in greater detail in the 'Pharmaceutical Journal,' vol. i. p. 274.

Potassæ Permanganas.—In the laboratory we find Bœttger's process (Zeitschrift für Chem. und Pharm., Bot. 3, and Chemical News, vol. iv. p. 69) preferable to the one given in the Pharmacopœia. Bœttger's process is as follows:—Fuse together in an iron crucible four parts of hydrate of potash and two parts of chlorate of potash, and when oxygen begins to be evolved, remove the crucible from the fire, and stir in gradually one part of peroxide of manganese. Heat again until the mixture solidifies, then boil it with eighty parts of water, and finally pass carbonic acid through the solution until it becomes red. The liquid is now decanted, filtered through gun-cotton, evaporated to one-half, and set aside to cool. Large crystals of the permanganate may be thus obtained.

Potassæ Sulphas.—This unimportant salt is one of the many in the Pharmacopœia, processes for the preparation of which are given, but which might well have been omitted altogether. If this is one of the processes introduced in order, according to Garrod (Med. Times and Gaz. 1864, vol. i. p. 359), to propagate a certain amount of knowledge of chemistry among a large class, both of the medical profession and druggists, who look upon the Pharmacopœia as a text-book, then it has failed in its object. For although in our laboratory, for example, we are rigid upholders of undeviating adherence to the Pharmacopœia in all that relates to the *galenical* compounds, yet in sulphate of potash and many other *chemical* substances we adopt different and, as we think, better means of arriving at the desired end. We think with Garrod (*ibid.*), that the only point required to be secured in the manufacture of chemical substances is their purity or fitness for medicinal administration, and a complete set of tests for each article ensures this.

To make sulphate of potash, we are directed to take of the residue of the process for nitric acid, one pound. This residue, you know, is bisulphate of potash. This is to be dissolved in water; then slacked lime, eight ounces, gradually added—directions to stir well, which is imperative, being omitted—until reddened litmus-paper, immersed in the mixture, is restored to a blue colour. We shall now have formed much sulphate of lime, the greater part of which will have been precipitated, but some will remain in solution; we are therefore to filter the solution through calico, and, having heated it to the boiling point, to add carbonate of potash as long as there is any precipitate. We now have carbonate of lime precipitated, and are therefore to filter again. But our solution of sulphate of potash thus obtained will be contaminated with carbonate of potash; we are therefore to add dilute sulphuric acid so as to produce a

neutral or slightly acid solution; this it does, of course, by decomposing the carbonate of potash, producing sulphate of potash. Finally the solution is to be evaporated till a film forms on the surface, and then set by for twenty-four hours; the crystals which will have formed by that time are to be dried on filtering paper, and preserved in a bottle. Now in the laboratory we find it convenient to follow the first line of this process and the last, but to skip over all between. To solution of bisulphate of potash we add carbonate of potash until no more effervescence is produced, and then evaporate and crystallize; and operating upon one pound, we find our process quite as economical as that of the Pharmacopœia.

Pulvis Antimonialis.—Antimonial powder is quite a feature in the new Pharmacopœia. Standing prominently out in the older Pharmacopœias as inconstant in its chemical properties, uncertain in its therapeutical effect, and altogether unsatisfactory and empirical, it is now noticeable for its simplicity of formation and perfectly definite character: it is simply a mixture of one part of oxide of antimony with two parts of phosphate of lime. We can only wonder, indeed, that the process for its preparation was not introduced into the London Pharmacopœia of 1851, for it had been described nine years before that date in the pages of the 'Pharmaceutical Journal.' Old Quincy, speaking of antimony, says, "There is at this time in the hands of some empirics, medicines from this basis, which are an intolerable scandal to learning and education." Spurred on by that observation, Tyson, a medical practitioner whom I have already had occasion to cite, began, some fifty years ago, to inquire into the virtues of the various preparations of antimony. This he did both by analysis and by carefully watching their effects on the animal economy, and the results of his observations were communicated to this Society at the Pharmaceutical Meeting of February 9th, 1842 (Pharm. Journ. vol. i. p. 449). After torturing antimony in all ways, and trying, in the course of his practice, all its forms in all febrile diseases, in patients of all ages and of all temperaments, he became satisfied that we had only two preparations worthy of notice, and that these two were invaluable, namely, the tartrate and the oxide; that the oxide was, in fact, the base of every useful preparation of antimony; thus proving the truth of the remark in Duncan's 'Edinburgh Dispensatory,' that "oxide of antimony with phosphate of lime is one of the best antimonials we possess." In comparing the effects of James's powder with the pulvis antimonialis of his day, Tyson sometimes found their virtues so alike in all their combinations as not to be distinguished. Sometimes he had occasion to prefer James's powder to the pulvis antimonialis; at other times he had reason to give to pulvis antimonialis the preference, finding that in James's powder there was considerable variation, but in his mixture of oxide of antimony and phosphate of lime he found, as he says, "a preparation far superior, being always the same and always certain." Tyson made his phosphate of lime from bones by the same process as that now given in the British Pharmacopœia, and also procured his oxide of antimony by the method there adopted. He dissolved sulphide of antimony in hydrochloric acid to form what in the Pharmacopœia is termed *Liquor Antimonii Terchloridi;* this he poured into water to form the "pulvis algarothi," or oxychloride of antimony, just the proceeding we are now to follow in making *Antimonii Oxydum*; and his oxychloride, like ours, was finally washed with an alkaline carbonate to remove all traces of the chlorous element, leaving pure hydrated oxide of antimony. Writing in 1842, Tyson, at the conclusion of his paper, said, "The above form of Pulvis Antimonialis I have now used for upwards of twenty years; and such is my estimation of its value in the cure of disease, that if I wished to leave a legacy to my country, I think I could not bequeath to her a greater boon. I have long found it unnecessary to use either James's powder or the Pulvis Antimonialis of the Pharmacopœia; and I am quite sure that when the

above preparation is universally known, not one single grain of that uncertain, expensive, and empirical medicine, James's powder, will ever again be sold. My great wish is to see the above formula introduced into the London Pharmacopœia." Had Tyson lived, he would have seen his wish more than fulfilled.

PULVIS AROMATICUS.—This aromatic powder closely resembles the *Confectio Aromatica* of the London Pharmacopœia, only that it is without chalk, and therefore is more truly an aromatic mixture, the old aromatic confection now having the more correct name *Pulvis Cretæ Aromaticus.* These two powders will therefore now replace the *Confectio Aromatica* of London and Dublin, the *Pulvis Aromaticus* of Edinburgh and Dublin, the *Pulvis Cinnamomi Compositus* of London, and the *Pulvis Cretæ Compositus* of London, Edinburgh, and Dublin. The cinnamom, nutmeg, saffron, cloves, cardamoms, and sugar of *Pulvis Aromaticus* are to be reduced separately to fine powder, mixed thoroughly, passed through a fine sieve, and kept in a stoppered bottle. Stocken (Pharm. Journ. 2nd ser. vol. i. p. 356) thought the saffron ought to be infused, the liquid evaporated to a syrup, and then mixed with the powders. Undoubtedly a powder of much brighter colour is thus obtained, and perhaps it would have been desirable to include that modification of manufacture in the British Pharmacopœia, for wholesale manufacturers will probably adhere to the instructions now laid down as little as they did to those formerly given, and thus aromatic powder be as variable in appearance as the aromatic confection was. It is the opinion of many that saffron might be altogether omitted from these preparations.

Pulvis Cretæ Aromaticus cum Opio replaces the *Pulvis Cretæ Compositus cum Opio* of the London, and the *Pulvis Cretæ Opiatus* of the Edinburgh and Dublin Pharmacopœias.

PULVIS SCAMMONII COMPOSITUS.—The old Dublin form for this powder was tolerably strong of scammony, the Edinburgh was stronger, and the London strongest; the British is a little stronger still.

QUINIÆ SULPHAS.—As a test of the purity of sulphate of quinia we are told in the Materia Medica division of the British Pharmacopœia that ten grains are perfectly dissolved by a half a fluid ounce of water containing ten minims of diluted sulphuric acid; and that ammonia throws down from this solution a precipitate which redissolves on agitating the whole with half a fluid ounce of "pure" ether. If any cinchonia were present it would remain undissolved. Now "pure" ether must not be used in this operation, or some of the quinia itself will remain undissolved. For Roger has shown (Chem. News, vol. v. p. 259) that the quinia which is precipitated from ten grains of sulphate of quinia is not dissolved by less than 250 grains of "pure" ether, whereas the half fluid ounce of pure ether ordered in the Pharmacopœia weighs only 158 grains (at 55°; sp. gr. being 724). It is true that the test given will generally be found to be satisfactory, but that is because "pure" ether is not likely to be used. Roger showed, indeed, that the quinia from ten grains of sulphate was perfectly dissolved by so little as 100 grains of ether, if that ether contained at least two per cent. of alcohol. Inasmuch then as most samples of ether contain alcohol, the test will only occasionally fail; but this renders the matter still more unfortunate, for experience will perhaps have produced confidence in the test, and the correctness of fallacious results be only the more strongly insisted on, and unpleasantness therefore be the more likely to arise between buyer and seller. Had the word "pure" been left out, the account of the test would have been quite correct, for we should have considered that the officinal ether, which contains alcohol, was intended to be used; in this ether the precipitated quinia dissolves readily.

RHEUM.—One or two tests are given for the purity of rhubarb in mass, but in the powder we are told that adulterations are detected with difficulty.

Billot's test (Chem. News, vol. i. p. 100) might perhaps have been included here. Two or three drops of an essential oil, such as bergamot, anise, or fennel, and a little magnesia are rubbed with the powder in a mortar, when no change of colour ensues if the specimen be pure Turkey or Russian root; but if it contains any home-grown root, the mixture assumes a tint varying from a salmon to the brightest rose-colour, according as there is little or much of the adulterating ingredient.

SANTONIN.—This is Mialhe's process (Pharm. Journ., vol. iii. p. 357) slightly improved. It is long and apparently complicated, but will be readily understood when it is remembered that santonin has the properties of a weak acid; that it forms a soluble salt with lime; that it is precipitable by acids, and insoluble in ammonia. The tests given for the detection of other matter in santonin will not indicate the presence of strychnia with which santonin is said to be sometimes adulterated. A case is recorded(Pharm. Journ., 2nd ser., vol. iv. p. 91) in which a fatal result followed the administration of some santonin, which was afterwards found to have contained twenty per cent. of strychnia.

SAPO MOLLIS.—This substance is one of the articles of the Materia Medica, but no process is given for its preparation. This is to be regretted, for the commercial article is seldom fit for use in medicine, and an excellent and simple method of making a perfectly pure neutral oleate of potash or soft soap was at the disposal of the compilers of the Pharmacopœia. In the Pharm. Journ., 2nd ser., vol. iv. p. 386, Wood shows that when lead plaster is rubbed in a mortar with carbonate of potash and alcohol, oleate of potash is formed, which alone dissolves in the alcohol; on distilling off the alcohol a pure soft soap remains.

SODÆ ARSENIAS is now officinal. It is the basis of the old "Pearson's Solution," and was recommended to be introduced into the Pharmacopœia by Bullock (Pharm. Journ., vol. x. p. 357); several physicians having stated it to be milder in its action than Liquor Arsenicalis, and moreover, the only form of arsenic easily admissible as an ingredient in pills. Garrod has recently confirmed this statement (Med. Times and Gaz., 1864, vol. i. p. 277), showing that patients, who from some unexplained cause, are absolutely intolerant of liquor arsenicalis, take *Liquor Sodæ Arseniatis* without any unpleasant result. Sodæ Arsenias is only used, in the Pharmacopœia, in the preparation of the liquor just named which is a solution of four grains of the *anhydrous* salt in every ounce of water. The arseniate of soda of the Pharmacopœia is represented as containing fourteen equivalents of water of crystallization, corresponding to 40·4 per cent. of water, and nearly 37 per cent. of arsenic acid. When freshly prepared, however, the salt generally contains twenty-four equivalents, corresponding to 53·7 per cent. of water, and only 28·6 per cent. of arsenic acid. The latter salt, however, very quickly effloresces in the air and is converted into the former, which does not effloresce even in warm air. These varying amounts of water in arseniate of soda will not interfere with the strength of the liquor, inasmuch as that variety of the salt which has no water of crystallization, that which has been dried at 300° and which contains nearly 62 per cent. of arsenic acid, is the one ordered to be used. But in prescribing sodæ arsenias in pills, physicians must remember that the salt which will be, or ought to be, dispensed is the Pharmacopœia salt containing only 37 per cent. of arsenic acid, almost twice as much of which therefore will have to be ordered to produce the same effect as a given weight of the sodæ arsenias of the liquor would produce. Pharmaceutists will also take care that the comparatively weak salt containing twenty-four equivalents of water of crystallisation be not used for any preparation; it is readily known by its property of efflorescence.

SODÆ BICARBONAS.—The process and apparatus recommended for preparing this salt are the same as those for potassæ bicarbonas, and will also be found described more fully in Pharm. Journ., vol. i. p. 274.

Sodæ Carbonas Exsiccata.—In drying carbonate of soda it is not now heated to redness, as formerly; the resulting salt will consequently be more readily soluble in water and the objections to the old carbonate urged by Ince (Pharm. Journ., vol. iii. p. 279) and Muskett (Pharm. Journ., 2nd ser., vol. i. p. 214) be removed. The present process, however, which is from the last Dublin Pharmacopœia, has also been shown by Draper (Dub. Med. Press, and Pharm. Journ., 2nd ser., vol. iii. p. 129) to be objectionable, inasmuch as it yields a hard cake difficult to powder. He proposes that the bicarbonate of soda be used as a source of dried carbonate; the product on heating to redness being a fine white pulverulent pure monocarbonate.

(To be continued.)

ORIGINAL AND EXTRACTED ARTICLES.

THE NEW PHARMACY BILL.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—As the draft of the proposed Pharmacy Act is now published, its various clauses are fairly open to criticism. Every one interested and connected with Pharmacy must be unanimous in the wish to unite the whole body of chemists in the proposed legislative Act.

In the first place, it is only fair that all existing interests should be preserved intact.

Secondly,—It is proposed to register all chemists and druggists, and their assistants, upon the payment of one guinea for such registration; after which their connection with the Society is ignored, unless they pass the Minor examination, and become Associates. I take it that this is not a fair recognition of the large body of chemists and druggists; would it not be better to unite the whole body with the full privileges of membership upon a smaller annual payment—say half a guinea per annum?

Thirdly,—Surely it is not the intention of the proposed Act to register the present members and founders of the Pharmaceutical Society as chemists and druggists, and take from them their present title of Pharmaceutical chemists; if so, that will be an act of injustice to those who have given their time and money, and recognized the progressive principles of the Society.

Fourthly,—Let those who are non-members be registered as chemists and druggists; the present members retain the title of Pharmaceutical Chemists; the examined members, Pharmaceutical Chemists (by examination).

I am, Sir, yours respectfully,

54, *Stanhope Street, Liverpool.* J. Thompson.

AN "INSATIATE MONSTER."

TO THE EDITORS OF THE PHARMACEUTICAL JOURNAL.

During the month of June, 1863, I placed in an unglazed one-gallon jar fifty healthy leeches.

At the end of a week my assistant reported seven dead. This appeared unaccountable, as the water had been changed daily, kept cool, and the access of any deleterious matter guarded against. Next day there were nine more deaths, and in the day following twelve. I now began to feel not a little interested as to the cause of this most unusual mortality; and on examining the dead leeches found that each one had three or four hardened swellings upon the under surface, the mouths distended, and the whole substance flabby. Next day there were fifteen more victims, all presenting a similar appearance.

In order more fully to investigate the matter, the remaining leeches were transferred to a large glass jar. The first noticeable circumstance was their extreme restlessness—at first attributed to the strong light—but on closer inspection a stranger was discovered whose presence was evidently unwelcome to the family.

In shape not unlike a very small millepede or woodlouse, it had long antennæ and numerous legs. On examination, under a magnifying power of 8 diameters, the whole intestinal canal was seen distended with blood; this entirely disappeared in the course of fifteen minutes, proving the rapidity of digestion and assimilation. The mouth was armed with a formidable pair of pincers, and the forelegs with hooked claws.

On making particular examination, every one of the swellings upon the dead leeches was found to have in its centre a punctured wound—"each in itself a death;" the verdict was therefore soon decided, and the culprit placed in a preparation jar of water in order to watch its movements. It appeared to be actively engaged in seeking food; probably living upon Infusoria, where larger prey is not to be obtained. It became however gradually more attenuated, until at the end of a week it died.

The question naturally arises, how did this little destructive gain admission to the jar? Was the *ovum* attached to the body of a leech, or deposited under the skin, as is practised by the ichneumon flies upon caterpillars, or was the germ conveyed in the water supplied from the Thames? as I have frequently noticed Monoculi and other animalcules in our unfiltered water; but this seems the less probable as the water was changed daily, and the time required to hatch might have occupied several days. The subject is certainly one of some importance, and commends itself not only to entomologists, but to all who keep such risky live-stock as leeches.

R. GOODWIN MUMBRAY.

Richmond, S.W.

CAUSE OF CHANGE IN ESSENTIAL OILS.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

"We give a new name to a phenomenon, and fancy we have given a reason. Facts, not reasons, are as plentiful as blackberries."

Sir,—At folio 498, 'Pharmaceutical Journal,' Vol. V., Mr. Charles Tomlinson, Lecturer on Science, King's College School, London, is reported to have stated that, "if two oils pressed from the seeds were packed, one quite clean, and the other *more or less contaminated with gum or mucilage*, the latter would become more or less acidified, the *gum*, etc., *apparently* fermenting, and *then* setting up an *acidifying* action in the oil. This *may* explain some of the differences in the working and character of oils."

That gum, or mucilage, is ever present in the oils referred to has not been shown. The following are the results obtained by careful examinations of the precipitate, or deposit, invariably present in those oils:—The precipitate, or deposit, is insoluble in water, therefore cannot be mucilage nor gelatine. The precipitate, or deposit, is not coagulable by heat, therefore is not albumen. The precipitate, or deposit, exhibits the properties of adipocere, and spermaceti in its solubility in boiling alcohol, fixed oils, and oil of turpentine; in its liquefaction by heat, and in forming saponaceous compounds with alkalies. Finally, the precipitate, or deposit, differs from spermaceti in its greater solubility in alcohol and oils. Yours respectfully,

GEORGE WHIPPLE.

May 6th, 1864.

ACCIDENTAL POISONING BY MORPHIA.

On Friday, May 13th, an inquest was held at Chipping Hill, Essex, by W. Codd, Esq., on the body of Alice Harriet Alger, aged eight years, who died suddenly on Wednesday, May 11th. It appeared from the evidence of the mother, that the child had been ill, and was attended by Mr. Proctor, surgeon, who sent a mixture, of which two tablespoonfuls were given to the child; after which she became very much worse, when the mother sent for Mr. Proctor, who found the child in a dying state. Mr. Proctor stated in evidence that after witnessing her death, and the attendant symptoms, he suspected that the medicine contained some ingredient which ought not to have been in it. In consequence of that suspicion he took the remainder of the mixture home with him, and recollecting that a solution of morphia had been prepared in the surgery during the morning, it occurred to him that some of the preparation might have been put into the mixture. On applying certain tests, this supposition was corroborated. He then attempted to ascertain how the morphia could have got into the medicine. Mr. Kent, their assistant, had been preparing a solution of morphia in the surgery; the method being to powder the morphia in a mortar, and to add to it water and citric acid to dissolve it quickly. After this, it was filtered through paper into the bottle with a funnel. In order more conveniently to pour it into the funnel, as the lip of the mortar was large, Mr. Kent had emptied the solution into a glass measure, which held about half a pint, with a smaller lip, which generally contained water, and on retiring from the surgery for a few minutes, had left some of the solution in the glass measure, the process of filtering being a slow one, and the funnel being replenished as the liquid soaked through. He had not observed that Mr. Kent was using the glass measure for the solution, and in his absence had taken it up supposing that it contained water, as was usually the case, and had poured it into the mixture (replenishing the measure with water), which he handed to Mrs. Alger. The solution was almost colourless, and free from odour. About two ounces of the solution must have been poured into the medicine. [Mr. Proctor here exhibited the bottle containing the remainder of the mixture, which was only of a light yellow colour, although laudanum and other ingredients had formed part of the compound.] Mr. Proctor expressed his opinion so decidedly as to the cause of death, the symptoms tallying exactly with the the effects of morphia, that the jury considered a *post-mortem* examination unnecessary.

John Kent, assistant to Messrs. Gimson and Proctor, stated that on Wednesday, the 11th inst., he was engaged in preparing a solution of morphia in the manner described by Mr. Proctor. After preparing the solution he put some into the funnel, filtering it into the bottle prepared for its reception. He left the surgery for the consulting room, leaving a portion of the solution in a glass measure which he had filled from the mortar, that he might more easily pour it into the funnel. Mr. Proctor was in the surgery at the time, dispensing medicines at the same counter. He returned to the surgery in about two minutes, and observing that the glass measure was fuller than when he left and that its contents had less colour, he asked Mr. Proctor whether he had poured the rest of the solution into the filter, who said, "Yes." Imagining that the solution was in the appropriate bottle, and having the impression that Mr. Proctor had seen him using the measure, he was satisfied.

Mr. Proctor, at this point, explained that he had poured a portion of the contents of the measure, before using it for the medicine, into the filter as the liquid subsided, imagining then that it contained water, and that the solution of morphia was all in the bottle.

It was subsequently stated that it is the practice in manipulating to dilute, to the proper strength, concentrated peparations by the addition of water in this manner.

The Coroner, in commenting upon the depositions, suggested whether, under the circumstances, it would not have been highly desirable for Mr. Proctor to have ascertained beyond a doubt that the measure did contain water, and for Mr. Kent to have called Mr. Proctor's attention to the fact that it really contained some of the solution, on leaving the surgery. He suggested also the propriety of having all solutions of deadly poison coloured, that the possibility of accident might be avoided.

After consultation, the Jury returned a verdict to the following effect:—"That Alice Harriet Alger died from taking a certain quantity of a solution of morphia, which was mixed in certain medicine by Alexander George Proctor, he believing it to be water."

CHARGE OF MANSLAUGHTER AGAINST A HERBALIST.

At the *Central Criminal Court*, May 11th (before Mr. Justice Williams), John Stevens was indicted for the manslaughter of William Probee. Mr. Poland conducted the prosecution, and prefaced the examination of witnesses with a statement, to the effect that the prisoner, formerly a grocer, was now a medical botanist, in High Street, Whitechapel, and held himself out as an agent of Dr. Coffin, a herbalist. He was charged with causing the death of William Probee, a lad of fifteen, by administering to him improper and dangerous medicines under circumstances which would be related in evidence. The law on the subject, he observed, had been laid down by the late Justice Buller, who on one occasion said he took it to be quite clear that if a person not of medical education undertook to administer medicine which might have a dangerous effect and thereby caused death, such a person was guilty of manslaughter. The prisoner was defended by Mr. Serjeant Ballantine and Mr. Sleigh. It was proved in evidence that on Sunday, March 20th, the deceased, William Probee, was taken ill, and that in the evening his father went to consult the prisoner, and brought back a bottle of medicine, a box of pills, and a powder. The patient took the whole of the mixture, the powder, and eight of the pills the same evening. On Tuesday he was much worse, and a powder was obtained from the prisoner, which was given to the boy. The next day he was worse, and Dr. Monk was then called in, and prescribed some medicine; but it was not given to the boy, as the father "had much faith in the prisoner." Mr. Cumming, a surgeon, was also called in and sent some medicine, but this was not given, and the prisoner continued to see the boy until his death, which took place six days after taking the medicine first prescribed by the prisoner. Mr. Serjeant Ballantine, in addressing the jury on behalf of the prisoner, contended that the whole question was one of opinion. Medical practice of late years had undergone a complete revolution, and homœopathy had taken the place of blood-letting. The prisoner contended that he had made no mistake, and that the remedies he had used were proper; if he was in error in selling capsicum, then every patent medicine vendor in the kingdom was liable to be indicted.

Mr. Justice Williams, in charging the jury, said, that if the prisoner had been guilty of an unlawful act in the administration of the medicine, he was undoubtedly responsible for his conduct, and was guilty of manslaughter. The first question the jury would have to decide was this, whether they were satisfied that the death of the deceased was attributable to that unlawful conduct; and that the death of the deceased was the result of the medicine administered to him by the prisoner after the latter had undertaken the treatment of the case. The law of the land upon the subject was this, that there was no distinction whatever to be drawn between the case of a man who had qualified in the ordinary way for the practice of medicine, and a person who had not done so. Whether a medical attendant were authorized or not to act as such, made no difference; he was not responsible criminally for any mistake of judgment which might be imputable to him, unless that mistake of judgment could fairly be attributable to gross ignorance or want of skill on his part. The most eminent practitioner that ever lived had made and might make a mistake in the treatment of a particular patient, and he was no more responsible for that mistake than any other practitioner would be of lesser skill. In other words, if it were a mere mistake of judgment, he would not be responsible; but if the mistake he had made would not have been made but for his want of skill, then he was answerable for the consequences, because no man had a right to undertake the treatment of the disease of another, unless he was possessed of competent skill and judgment. Therefore, the inquiry was divisible into two branches,—first, was it made out to the satisfaction of the jury that the death of the boy, William Probee, was caused by improper medicines administered to him by the prisoner after he had undertaken the treatment of the case? If they were satisfied that the medicine was a proper medicine, and that that medicine had not superinduced the death, of course there would be an end of the inquiry; but if they should be of opinion that the death was attributable to the administration of the medicine, then would come the inquiry, was the administration of that medicine the result of ignorance and want of skill? The case was undoubtedly one of first-rate importance, because it was most salutary for the interests of the public that an unqualified person, acting ignorantly and without skill, should be punished for manslaughter if death resulted from his acts.

The jury then returned a verdict of *Not Guilty*, and the prisoner was discharged.

BOOKS RECEIVED.

Essentials of Materia Medica and Therapeutics. By Alfred Baring Garrod, M.D., F.R.S., etc. Second Edition, revised and much enlarged. London: Walton and Maberly. 1864. The following extract from the Preface will indicate the character of this new edition of an important text book of Materia Medica:—"A Table of Contents, by a glance at which the reader will at once see all drugs scientifically arranged, together with their pharmaceutical preparations, is contained in the present edition; as likewise a table indicating the principal changes in nomenclature and important differences of strength between preparations in the British Pharmacopœia, and in the London Pharmacopœia, 1851; and lastly, a somewhat copious Posological Table is now introduced." A separate volume, devoted exclusively to the consideration of the value of medicines in the treatment of disease, and embracing the whole subject of Therapeutics, is expected to appear in a few months. This was originally intended to have formed part of the present volume, announced under the title of "Medicines: their Nature and Value in the Treatment of Disease;" but the publication of the British Pharmacopœia rendered it desirable that a text-book should be in the hands of students without delay. We hope to notice this work fully in our next Number.

On the Practice of Employing Certain Substitutes for the Genuine Ingredients in some Articles of Daily Food: considered as it affects the Health of the Community. A Paper read before the Brighton Literary and Scientific Institution. Contributed by a Lady. London: H. K. Lewis, 15, Gower Street North; Brighton: John Farncombe, 92, Eastern Road.

Paper read before the Social Science Association, On the Production and Use of German Yeast in this Country. By John Mackay, Pharmaceutical Chemist, Edinburgh. Printed by Alexander Grant. 1864.

Notes on the British Pharmacopœia, 1864. Leeds: Harvey and Reynolds. 1864.

Erratum.—In the report of the proceedings of the *Nottingham Chemists' Association*, page 555, we are requested to make a correction in the words attributed to Mr. Heathfield, which should run thus:—"The practical value of many of the processes was much diminished by the difficulty experienced by many who had no acquaintance with chemical manipulation, and by the imperfect manner in which some of the descriptions were indited."

TO CORRESPONDENTS.

In reply to several Correspondents, we beg to state that during the present session students will be examined in the London Pharmacopœia; after October an acquaintance with the British Pharmacopœia will also be expected.

Chemicus.—Syrup of Phosphate of Iron. Vol. I., Second Series, page 497. It is now recognized in the British Pharmacopœia.

X. Y.—Test-paper for detecting ozone is made by immersing white paper in solution of iodide of potassium and starch.

Chirurgus.—Essence of Camphor. Camphor ʒiij, Aqua Destillata ℥vj, Sp. Vini Rect. ℥x. An Essence of Peppermint for the purpose intended may be made, in the proportion of 2 drachms of Oil of Peppermint to 16 ounces of spirit.

An Associate.—Acetate of Silver is soluble in Ammonia.

Pharmaceutist (Wolverhampton).—A decoction of Castor-oil leaves is sometimes applied to the breast for the purpose of promoting the secretion of milk.

F. H. P.—A list of Registered Apprentices appears monthly in the Journal.

Garibaldi.—An examination would be advisable, although not compulsory, in the case alluded to.

M. P. S., *S. B.* should consult any work on Materia Medica.

Mr. Leay and *Mr. Pooley* (Bath) and *A Druggist* (Birmingham) are thanked for their communications.

An Assistant (Halesworth).—See our first notice to Correspondents.

Anxious Inquirer (Jamaica).—(1) See our first notice to Correspondents. (2) Pereira's Materia Medica. About October next.

Botanicus.—Bentley's 'Manual of Botany' and Babington's 'Manual of British Botany.'

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END OF VOL. V., SECOND SERIES.

JOHN E. TAYLOR, PRINTER, LITTLE QUEEN STREET, W.C.




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